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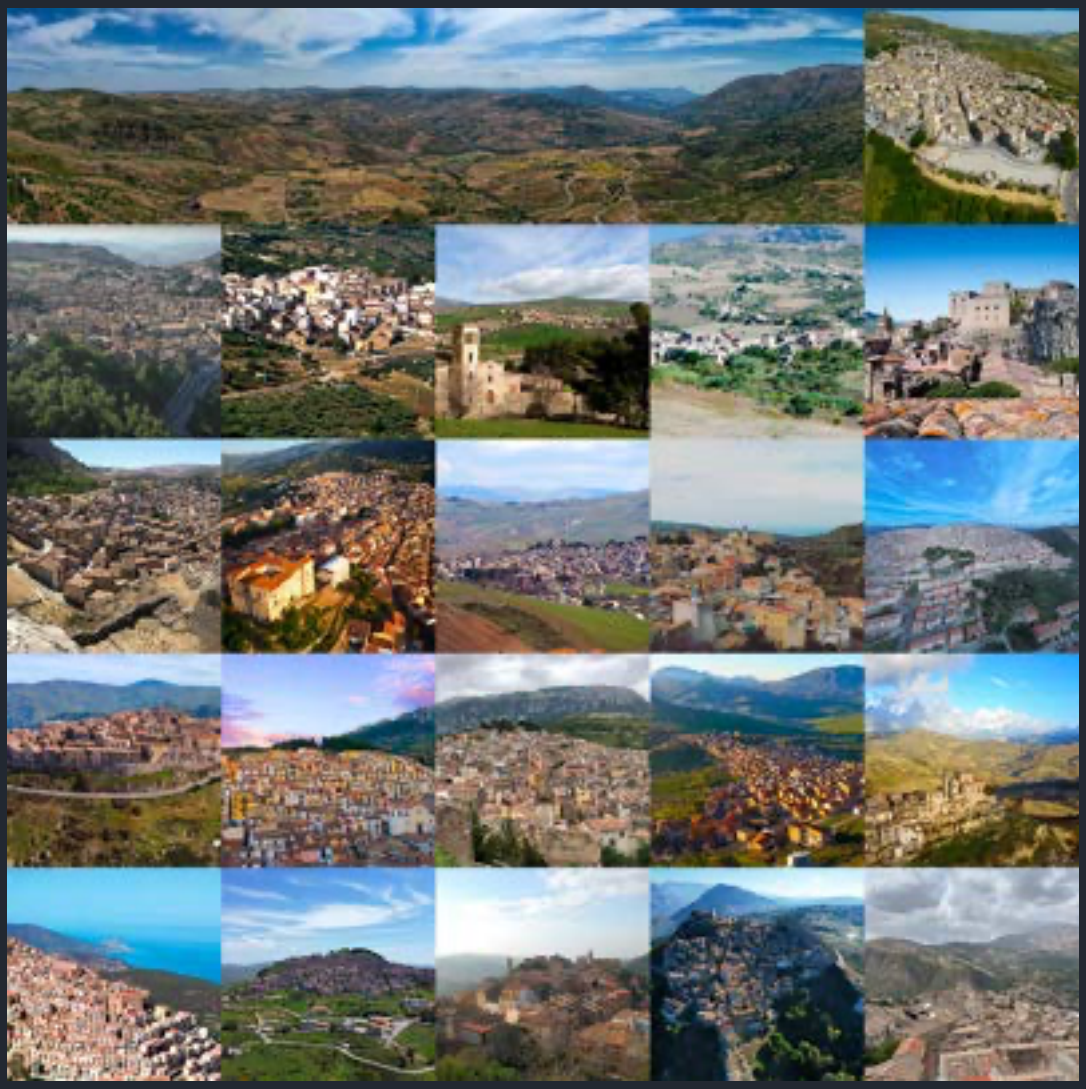
Coordinatore: Prof. Arch. Marco Rosario Nobile

CENTRI MINORI INTELLIGENTI NEL PARCO DELLE MADONIE IN SICILIA

STRATEGIE DI RECUPERO E VALORIZZAZIONE DELLE AREE INTERNE



Dottoranda: Ing. Luisa Lombardo
Tutor: Prof. Ing. Ph.D. Tiziana Campisi
Co-Tutor: Prof. Arch. Ph.D. Simona Colajanni
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architettura Tecnica
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G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architectural Engineering

SMART VILLAGES
IN THE MADONIE PARK IN SICILY

STRATEGIES FOR THE REHABILITATION AND ENHANCEMENT OF INNER AREAS

THE DOCTOR
Eng. Luisa Lombardo

THE COORDINATOR
Prof. Arch. Marco Rosario Nobile

THE SUPERVISOR
Prof. Eng. Ph.D. Tiziana Campisi

SopriPa Supervisor
Arch. Delia Geraci

THE CO-SUPERVISOR
Prof. Arch. Ph.D. Simona Colajanni

(R+) Supervisor
Prof. Arturo Zaragozá Catalán
(UPV) Co-Supervisor
Prof. Rafael Marín Sánchez

CYCLE XXXVII
YEAR OF DEGREE AWARD 2025

...without haste, but without rest.

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Acronyms and Abbreviations

ABAR - Archaeology, Fine Arts, and Landscape: Sectors for the protection of cultural heritage under the Ministry of Culture (MIC).

APS - Social Promotion Association: Non-profit organization for social purposes.

GAL - Local Action Groups: Tools for local development within the Leader Program framework.

GTF - Green Transition Fluid: Tools and resources for ecological transition.

DOP - Protected Designation of Origin: European certification for high-quality agricultural and food products linked to a specific territory.

DPCM - Decree of the President of the Council of Ministers: Regulatory instrument issued by the Italian government.

EU - European Union.

EC - European Commission.

ENDR - European Network of Defence-related Regions.

FESR - European Regional Development Fund.

FEASR - European Agricultural Fund for Rural Development.

FOSMIT - Fund for the Development of Italian Mountains.

IBI - Biodiversity Index: Indicator to measure the well-being of a territory beyond GDP.

ICT - Information and Communications Technology.

ICOMOS - International Council on Monuments and Sites: International organization for the protection of cultural heritage.

IGP - Protected Geographical Indication: European certification for products with partial geographical linkage.

ISTAT - National Institute of Statistics: Italian statistical agency.

MISE - Ministry of Economic Development: Italian ministry previously responsible for economic policies (now merged into MIMIT).

MEF - Ministry of Economy and Finance: Italian ministry responsible for economic and fiscal policies.

NGEU - Next Generation EU: European plan for post-COVID economic recovery.

NGO - Non-Governmental Organization

MIC - Ministry of Culture: Italian ministry responsible for cultural heritage.

OECD - Organization for Economic Cooperation and Development

PAC - Common Agricultural Policy: European policy to support agriculture.

PIL - Gross Domestic Product: Economic indicator used to measure the wealth produced in a territory.

PNRR - National Rehabilitationand Resilience Plan.

PPP - Public-Private Partnership.

PSRN - National Rural Development Program.

PSP - Strategic Development Plans: Planning documents for territorial development.

SDGs - Sustainable Development Goals: United Nations goals for sustainable development.

SNAC - National Strategy for Climate Change Adaptation: Italian plan to address climate change.

SNAI - National Strategy for Inner Areas: Italian program for the regeneration of inner areas.

SNAMI - National Strategy for Mountain Areas: Development program for mountainous territories.

SPID - Public Digital Identity System: System for accessing online services of Public Administration.

STCE - Additional Protocol to the Council of Europe Convention.

SV - *Smart Villages*: Villages characterized by the integration of innovative technologies and sustainable development strategies.

VIA - Environmental Impact Assessment: Procedure to assess the impact of works on the territory.

SDGs - 2030 Agenda

This thesis aims to promote the following key objectives for the pursuit of sustainable development, specifically:

7. Clean and affordable energy: Promote the adoption of innovative technologies for the production and efficient use of renewable energy, including the rehabilitation of built heritage and the implementation of energy communities;
8. Decent work and economic growth: Foster a sustainable local economy that values endogenous resources and cultural heritage, creating stable and inclusive job opportunities;
9. Industry, innovation, and infrastructure: Encourage the development of resilient and sustainable infrastructures, integrating technological innovation and traditional materials;
10. Reducing inequalities: Implement strategies that ensure equitable access to resources, services, and opportunities, reducing the gap between rural and urban areas;
11. Sustainable cities and communities: Create tools and guidelines for the smart rehabilitation of urban and rural heritage, focused on sustainability and community engagement;
12. Responsible consumption and production: Promote the reuse and recycling of materials in the construction sector, supporting the circular economy and limiting environmental impact;
13. Climate action: Integrate climate change mitigation and adaptation measures into territorial management and heritage conservation policies;
15. Life on land: Protect and enhance the natural landscape and biodiversity, promoting sustainable management of forest and agricultural resources;
17. Partnerships for the goals: Build a collaborative network among institutions, communities, and private actors to promote integrated and sustainable development strategies, inspired by the *Smart Villages* model.

Fig. 1 - SGDs per le aree rurali ©Luisa Lombardo, 2024

Abstract IT

La presente tesi dottorale, progetto finanziato dall'INPS – Istituto Nazionale di Previdenza Sociale - ha come obiettivi la valorizzazione e fruizione dei territori delle economie fragili e l'istituzione di buone pratiche nella gestione dei beni culturali. Il percorso di ricerca ha focalizzato lo studio sull'area del Parco delle Madonie, una delle aree SNAI italiane, situata nella Provincia di Palermo. L'obiettivo principale è stato quello di promuovere la transizione digitale e, allo stesso tempo, preservare la memoria storica dei luoghi con l'intento di promuovere lo sviluppo di *Smart Villages,* ovvero comunità rurali intelligenti.

L'obiettivo di questa ricerca è adottare un approccio intelligente che coniughi tradizione e innovazione, mantenendo la compatibilità con il patrimonio costruito e naturale. L'area delle Madonie rappresenta un'area protetta che possiede un patrimonio architettonico, naturalistico e faunistico di inestimabile valore. Comprendente 21 Comuni, la zona si estende nel cuore della Sicilia, abbracciando le Province di Palermo, Enna, Caltanissetta e Messina.

Nel corso della stesura di questa tesi, è stato tenuto in considerazione l'approccio metodologico adottato durante i tre anni di ricerca dottorale. Inizialmente, è stata condotta un'analisi dello stato dell'arte approfondita degli *Smart Villages* presenti nel panorama extraeuropeo ed europeo, con l'identificazione delle tematiche maggiormente implementate e delle strategie *smart* adottate. In particolare, è stata anche esaminata l'area della Comunità Valenciana, grazie al periodo di ricerca svolto all'estero presso la Real Academia de Bellas Artes de San Carlos de Valencia e l'Universitat Politècnica de València. Ulteriori approfondimenti riguardo ai casi di studio, soprattutto italiani, sono stati condotti tramite interviste a docenti, professionisti, cittadini e aziende che hanno lavorato o lavorano nelle aree interne, per comprendere il ventaglio degli approcci possibili intrapresi già negli ultimi anni. Al fine di applicare un approccio *smart* alla metodologia, è stata creata una rete di supporto alla ricerca, coinvolgendo *Partners, Cluster, Stakeholder* e facilitatori del comprensorio madonita nelle strategie da adottare. Riguardo all'area di riferimento, è stata eseguita una mappatura delle diverse tematiche intelligenti per identificare quali territori del comprensorio risultino attualmente più o meno *smart*.

La tesi propone la creazione di un Atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie in collaborazione con la Soprintendenza dei Beni Culturali e Ambientali della Provincia di Palermo, istituzione presso cui è stato svolto un tirocinio di un anno come da borsa assegnata. Lo strumento è volto alla collazione di tecnologie e strategie adottate in contesti ben conservati e tutelati per trasporle e proporle nel caso studio analizzato al fine di promuovere l'innovazione. Inoltre, vengono altresì elaborate delle Linee guida per il Centro Storico di Polizzi Generosa, un caso pilota scelto tra i 21 comuni dell'area delle Madonie, con l'intento di promuovere un recupero intelligente del patrimonio edilizio esistente, nel rispetto della tradizione costruttiva locale e dell'architettura di base. Infine, nel terzo capitolo, si intende formulare un possibile assetto organizzativo degli *Smart Villages* promuovendo linee guida, *Best Practices, Business Plan* e protocolli di gestione per formulare un nuovo sistema di sviluppo territoriale nelle aree interne in linea con gli obiettivi per lo sviluppo sostenibile promossi dall'Agenda 2030.

Abstract EN

This doctoral thesis, a project funded by INPS – the Italian National Institute of Social Security – aims to enhance and promote the use of territories characterized by fragile economies and to establish best practices in the management of cultural heritage. The research focuses on the area of the Madonie Park, one of the Italian SNAI (National Strategy for Inner Areas) territories, located in the Province of Palermo. The primary objective is to promote digital transition while simultaneously preserving the historical memory of the sites, with the ultimate aim of fostering the development of Smart Villages, or intelligent rural communities.

The purpose of this research is to adopt an intelligent approach that combines tradition and innovation, maintaining compatibility with both built and natural heritage. The Madonie area is a protected region with an invaluable architectural, naturalistic, and wildlife heritage. Comprising 21 municipalities, the territory extends into the heart of Sicily, encompassing the Provinces of Palermo, Enna, Caltanissetta, and Messina. During the development of this thesis, the methodological approach adopted throughout the three years of doctoral research was carefully considered. Initially, an in-depth analysis of the state of the art regarding Smart Villages in both extra-European and European contexts was conducted, identifying the most widely implemented themes and the smart strategies adopted. Notably, the Valencian Community was also examined thanks to the research period carried out abroad at the Real Academia de Bellas Artes de San Carlos de Valencia and the Universitat Politècnica de València. Further investigations into case studies, particularly Italian ones, were conducted through interviews with academics, professionals, citizens, and companies working or having worked in inner areas to understand the range of approaches undertaken in recent years. To apply a smart approach to the methodology, a research support network was established, involving partners, clusters, stakeholders, and facilitators from the Madonie territory to define the strategies to be adopted. Regarding the area under consideration, a mapping of the various smart themes was performed to identify which territories in the district are currently more or less aligned with smart principles.

The thesis proposes the creation of an Atlas of Technological Solutions for the rehabilitation and enhancement of the inner areas of the Madonie Park in collaboration with the Soprintendenza dei Beni Culturali e Ambientali of the Province of Palermo, where a one-year internship was completed under the scholarship program. This tool is intended to compile technologies and strategies adopted in well-preserved and protected contexts and to transpose and propose them in the analyzed case study to foster innovation. Additionally, the thesis includes the development of Guidelines for the Historic Center of Polizzi Generosa, a pilot case chosen among the 21 municipalities of the Madonie area, aimed at promoting intelligent rehabilitation of the existing building heritage while respecting local construction traditions and fundamental architecture.

Finally, in the third chapter, the thesis aims to propose a possible organizational structure for Smart Villages by promoting guidelines, best practices, business plans, and management protocols to develop a new territorial development system for inner areas aligned with the Sustainable Development Goals promoted by the 2030 Agenda.

Abstract ES

Esta tesis doctoral, un proyecto financiado por el INPS – Instituto Nacional de Previsión Social de Italia – tiene como objetivos la valorización y el uso sostenible de los territorios caracterizados por economías frágiles y el establecimiento de buenas prácticas en la gestión del patrimonio cultural. La investigación se centra en el área del Parque de las Madonías, una de las áreas SNAI (Estrategia Nacional para Áreas Internas) italianas, situada en la provincia de Palermo. El objetivo principal es promover la transición digital mientras se preserva la memoria histórica de los lugares, con el propósito de fomentar el desarrollo de Smart Villages, o comunidades rurales inteligentes.

El propósito de esta investigación es adoptar un enfoque inteligente que combine tradición e innovación, manteniendo la compatibilidad con el patrimonio construido y natural. El área de las Madonías es una región protegida que posee un patrimonio arquitectónico, natural y faunístico de valor incalculable. Compuesta por 21 municipios, el territorio se extiende en el corazón de Sicilia, abarcando las provincias de Palermo, Enna, Caltanissetta y Messina. Durante la elaboración de esta tesis, se consideró cuidadosamente el enfoque metodológico adoptado durante los tres años de investigación doctoral. Inicialmente, se realizó un análisis detallado del estado del arte sobre los Smart Villages presentes en contextos extraeuropeos y europeos, identificando las temáticas más implementadas y las estrategias inteligentes adoptadas. En particular, se examinó también la Comunidad Valenciana gracias al período de investigación realizado en el extranjero en la Real Academia de Bellas Artes de San Carlos de Valencia y la Universitat Politècnica de València. Además, se llevaron a cabo investigaciones sobre casos de estudio, especialmente italianos, mediante entrevistas con académicos, profesionales, ciudadanos y empresas que trabajan o han trabajado en áreas internas, para comprender el abanico de enfoques adoptados en los últimos años. Con el fin de aplicar un enfoque inteligente a la metodología, se creó una red de apoyo a la investigación, involucrando socios, clústeres, partes interesadas y facilitadores del territorio madonita en las estrategias a adoptar. Con respecto al área de referencia, se llevó a cabo un mapeo de las diferentes temáticas inteligentes para identificar qué territorios del distrito son actualmente más o menos alineados con los principios inteligentes.

La tesis propone la creación de un Atlas de Soluciones Tecnológicas para la recuperación y valorización de las áreas internas del Parque de las Madonías, en colaboración con la Soprintendenza dei Beni Culturali e Ambientali de la provincia de Palermo, institución en la cual se completó una pasantía de un año como parte del programa de becas asignado. Esta herramienta tiene como objetivo recopilar tecnologías y estrategias adoptadas en contextos bien conservados y protegidos, para transponerlas y proponerlas en el caso de estudio analizado, promoviendo así la innovación. Además, se desarrollan Lineamientos para el Centro Histórico de Polizzi Generosa, un caso piloto elegido entre los 21 municipios del área de las Madonías, con el objetivo de promover una recuperación inteligente del patrimonio edilicio existente, respetando la tradición constructiva local y la arquitectura fundamental.

Finalmente, en el tercer capítulo, se pretende proponer una posible estructura organizativa para los Smart Villages, promoviendo lineamientos, buenas prácticas, planes de negocio y protocolos de gestión para desarrollar un nuevo sistema de desarrollo territorial en las áreas internas, alineado con los Objetivos de Desarrollo Sostenible promovidos por la Agenda 2030.

Presentation Video
Research Project

SMART VILLAGES
IN THE MADONIE PARK IN SICILY

STRATEGIES FOR THE REHABILITATION AND ENHANCEMENT OF INNER AREAS

Introduction

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Fig. 1 | Madonie UNESCO Geopark © Carmelo Di Salvo, 2022

1. Structure and content of the Thesis

This thesis aims to explore the feasibility and implementation of revitalization in Italy's inner areas, with a particular focus on the Sicilian context. It centers on the twenty-one small municipalities of the Madonie and their vibrant communities. The analysis serves as a preparatory tool for fostering innovation and opportunities, emphasizing the delicate art of breathing new life into Italy's and Sicily's remote corners. It strives to preserve the essence and authenticity of these territories while promoting their repopulation.

The primary objective of this research is to challenge the economic and social stagnation affecting inner areas by enthusiastically advocating for the adoption of *Smart Villages*—a modern perspective on villages rooted in technology and the intelligent application of innovative solutions, blending tradition and innovation. This approach offers a range of opportunities to foster economic and social development in areas where fragile economies tend to dominate.

Through an in-depth study of the Madonie Park, a UNESCO Geopark since 2015, this thesis aims to explore and outline new pathways for progress. This enclave, with its natural beauty and architectural charm, serves as an ideal laboratory to experiment with how innovation can harmoniously integrate with tradition and how technology can coexist with deeply rooted cultural identity. The twenty-one municipalities, each with its own history and distinctive character, provide a fertile ground for understanding the nuances and complexities of this evolution.

This doctoral thesis aims to challenge the stagnation and inertia of places where progress might seem an insurmountable goal, calling for boldness and ingenuity to create a synergy capable of revitalizing communities at risk of being forgotten. It is an investigation aimed not only at fostering economic development but also at preserving the cultural roots, architectural uniqueness, and social fabric that make these lands distinctive. The approach delves into less-traveled paths, embracing the spirit of innovation and offering a vision of how *Smart Villages* can serve as the key to unlocking the potential of rural areas, starting from their built heritage. It addresses the establishment of *Smart Villages* in the Madonie Park, Sicily, through a volume divided into three main sections, supplemented by appendices containing projects that form part of the research corpus.

Below is the outline of the research, organized into its main sections:

- **Chapter I – The development of inner areas through the creation of Smart Villages, a shared project**

The first chapter of the thesis explores the wide range of approaches, strategies, and regulations related to the development of *Smart Villages*. Its initial approach emphasizes an in-depth analysis of the scientific literature on *Smart Villages*, examining the key themes and approaches that have emerged in academic research to date. This is followed by a comparative study of *Smart Villages* at a global level, with particular focus on those outside and within Europe. The first phase of the investigation involved studying the strategies and regulations governing rural areas at the global, European, and Italian levels. This in-depth analysis will also include an investigation into the relevant regulations, particularly at the European and Italian levels, encompassing the Faro Convention, the Cork 2.0 Conference, the EU Action Plan for *Smart Villages*, and other key instruments that have contributed to an initial wave of innovation, although still insufficient. Special attention was given to examining successful case studies in order to enrich the understanding of the challenges faced by other rural communities and to understand the first solutions considered and implemented. This process included a thorough evaluation of the strategies, technologies, and innovations that have catalyzed the revitalization of territories, building a robust knowledge base to develop recommendations and possibilities to be applied to the Sicilian context. The chapter will then continue with a focus on the

protection of historic centers, analyzing the 2018 Davos Declaration, the ICOMOS guidelines on historic cities and villages, the "Salva Borghi" law, and many other regulations that have emerged in recent months, including those close to the conclusion of the thesis. The aim is to provide a comprehensive framework of the regulatory foundations and guidelines already developed, which can determine the creation and management of *Smart Villages*.

- **Chapter II – Inner areas in Sicily and the Madonie District. Towards the creation of a Smart Villages network**

The second chapter focuses on the unique characteristics of the Sicilian inner areas, with a specific focus on the Madonie Area and its 21 smaller municipalities. After an analysis of the territorial context and local identities, a detailed inventory of the features of each municipality will be presented, differentiating the territory into the High Madonie, Low Madonie, and Madonie Imerese regions. A subsequent SWOT analysis will assess the potential and challenges of the inner areas and the smaller municipalities of the Madonie. Gravitational areas have also been included in the analysis, as they are considered essential for the overall development of the region. The Municipality of Polizzi Generosa will be examined as a reference case study, offering a detailed analysis of its history, characteristics, challenges, and opportunities. The results of the research experience at the Superintendence of Cultural Heritage of the Province of Palermo will be illustrated, along with *insights* gained during the research abroad in Valencia, and similar case studies to the identified and analyzed reference case. This approach will serve as a comparison and dialogue between the areas and will help evaluate the approaches to be undertaken. Furthermore, the first proposed tool, the Atlas, will be introduced as a range of technological solutions applicable locally, as well as throughout the entire area.

- **Chapter III – Strategies for the rehabilitation, preservation, and enhancement of the local area through the *Smart* approach**

The third chapter will address the strategies for the rehabilitation and enhancement of inner areas, emphasizing the *smart* approach. It proposes the development of a management system and active and passive components capable of forming the *Smart Village* and ensuring its harmonious operation. Chapter III will explore the different dimensions of innovation, including technologies, the *green* economy, social innovation, and accessibility. In particular, a second tool to support smart municipalities will be proposed, such as the Guidelines for Polizzi Generosa, an exemplary case of knowledge, dialogue, understanding, and operability within the local architectural heritage. The chapter will proceed with the definition of *guidelines* based on *best practices*, creating a framework for successfully implementing *smart* strategies. Finally, the chapter will conclude with the formulation of management protocols and a *business plan* to ensure the long-term sustainability of *Smart Villages*.

- **Conclusion and Future Developments**

The conclusions will summarize the key findings from the research, providing a clear overview of the potential and challenges of *Smart Villages* in the Sicilian inner areas. Future developments will be proposed, encouraging reflection on how to concretely improve and implement the strategies outlined in the thesis. Specifically, *Guidelines*, *Best Practices*, *Business Plans*, and *Management Protocols* for the development of the territory in question will be proposed. The hope is that this research can serve as a practical guide to inspire and support the sustainable development of *Smart Villages* in the Madonie and beyond.

The research aims to achieve broad objectives, primarily promoting traditional architecture, craftsmanship, local production, technology, and di-

gitalisation to fuel the economy and strengthen the community's identity. At the same time, it seeks to create new job opportunities, counter youth migration, and position the region as a beacon for technological and digital innovation.

The accessibility of urban centers is a key focus as it enhances the connection between these vital centers and the peripheries, ensuring harmonious territorial development.

The research is committed to addressing demographic decline, attracting young people, new families, and new residents, promoting life in inner areas, and supporting the environmental sustainability agenda by considering the possibility of integrating the principle of mutual collaboration among places. It also aims to bridge the gap between rural regions and modern *Smart Cities*, improving services and creating an interconnected network of opportunities for balanced progress.

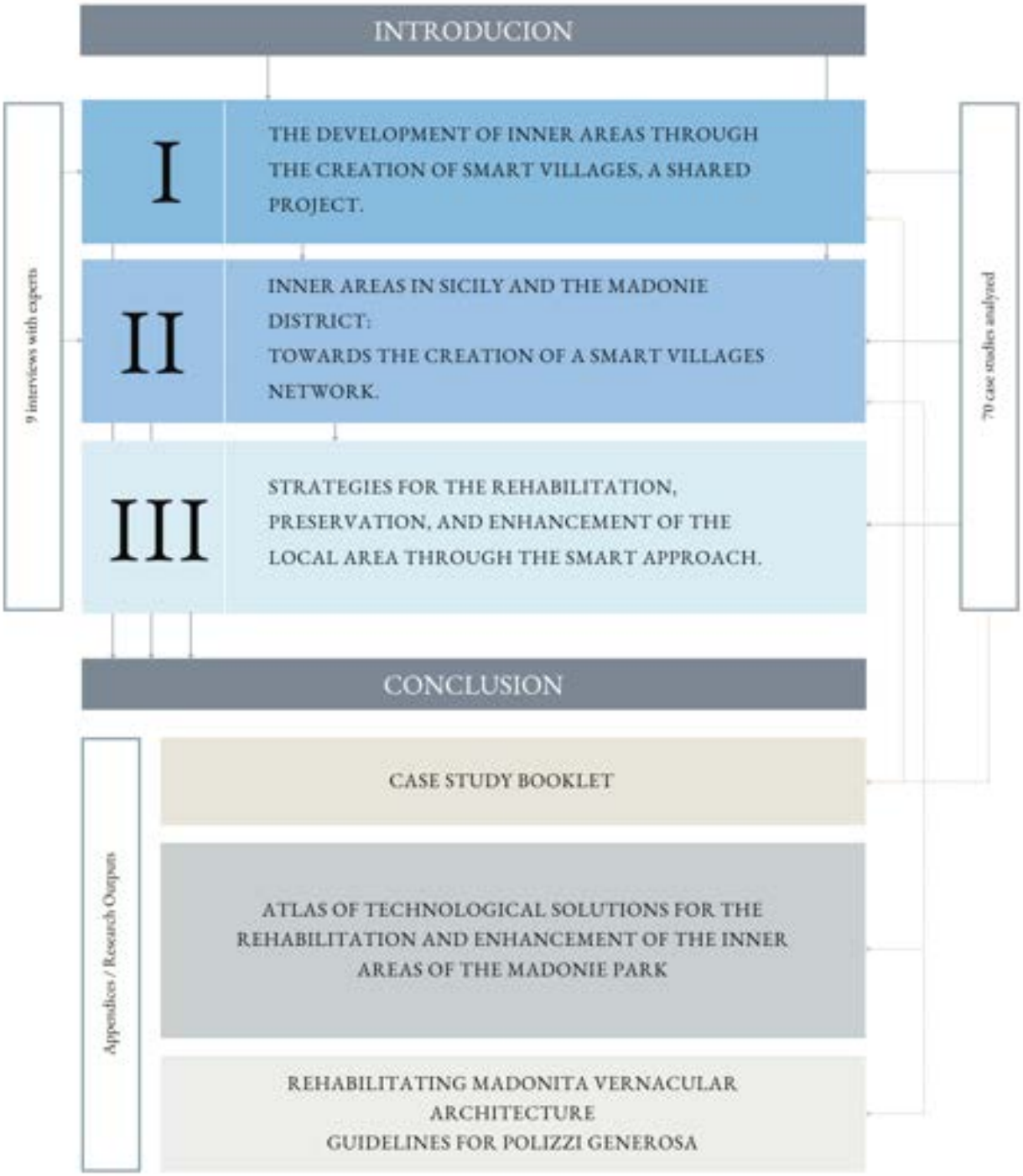

Fig. 2 | Research Framework © Luisa Lombardo, 2024

The investigation focused on examining technologies applicable to the built heritage and strategies for the success and innovation of the areas under study, carefully considering available resources and local challenges, while also embracing, at times, experimental solutions to offer an approach beyond what has already been done in order to promote innovation. The internship period at the Soprintendenza BB.CC.AA. of the Province of Palermo enriched the understanding of territorial dynamics, allowing for direct contact with heritage protection bodies, local communities, administrations, and associations. The experience was also extended to the Spanish context at the Real Academia des Bellas Artes de San Carlos and the Universitat Politècnica de Valencia (UPV), providing innovative and replicable perspectives.

The field experiences gained during the research and internship phases provided a pragmatic perspective on the work, enabling the adaptation of strategies in an authentic way. As a result, the thesis proposes the creation of an Atlas of technological solutions for *Smart Villages* in the Madonie, along with specific guidelines for the rehabilitation and enhancement of the small municipality of Polizzi Generosa, a pilot case. A rehabilitation manual, called *Guidelines*, with a cutting-edge and pragmatic approach for the revival of the Sicilian mountain regions, offering valuable support to implement sustainable and innovative development strategies, primarily considering the built heritage as the key to initiating processes of requalification and renewal of small centers.

The path taken includes the study of real cases, the detailed analysis of effective technologies and strategies, and the acquisition of direct field experience. The aim is to provide tangible recommendations, presenting a clear vision for the creation of *Smart Villages* as catalysts for change. The comparison with real cases strengthens the credibility of the project, enhancing its momentum towards concrete development of inner areas. The hope is that this research can inspire smaller centers, local administrations, citizens, businesses, and institutions, contributing to the progress of rural communities in Sicily and Italy, through analogy or contrast, as a whole.

2. Relevance and critical issues of the topic

The relevance of the topic addressed in this thesis is significant, as small towns account for 86% of Italy's urban areas and 60% of its rural areas. This research tackles the challenges faced by inner regions, which represent 53% of Italian municipalities, focusing on a systemic approach that goes beyond the administrative boundaries of the National Strategy for Inner Areas (SNAI) and the funds provided by the National Rehabilitationand Resilience Plan (PNRR).

Primarily located in the Italian Apennine region, inner areas represent a new field of study with challenges such as the deterioration of housing stock and economic and social decline. This research focuses on the vision for the rehabilitation of inner territories, examining smaller centers involved in international initiatives. The heritage present in these areas is a crucial asset for local interpretation and development, suggesting an innovative approach to the creation of *Smart Villages*. The persistent economic and social inertia that characterizes these areas has led to increasing marginalization and a real risk of demographic decline; at the same time, in recent years, there has been growing interest in revitalizing these areas, repopulating them, and bringing them back to prominence. In a context where the fragile economies of inner areas seem to have lost their momentum, the proposed approach of promoting *Smart Villages* emerges as a modern and innovative perspective. The "return" to inner areas emerges as a key element for regeneration, fostering reconnection between the entrepreneurial, institutional, and citizen dimensions. The wise use of technology and *smart* solutions could serve as a bulwark against decline, offering a new direction for economic and social development. This thesis aims to challenge this stagnation, calling for bold and ingenious change that can revitalize communities at risk

of oblivion. The detailed analysis of the study area, the Madonie Park, with its twenty-one distinctive municipalities, adds substance to the discourse, offering an ideal laboratory to experiment with the harmonious integration of innovation and tradition. The research not only suggests the adoption of technological solutions but also aims to preserve the cultural identity deeply rooted in these lands, thus contributing to the conservation of the historical and architectural roots that make them unique. The recent debate about the possibility of a "return" to inner areas, in response to the pandemic, has highlighted growing interest in this topic. The research supports the need for targeted territorial policies, as emphasized in the "National Rehabilitationand Resilience Plan," to promote the sustainable development of inner areas. The proposed strategies, from promoting local identity traits to enhancing the accessibility of urban centers, prove crucial in countering youth emigration and creating new job opportunities. Furthermore, prioritizing the environmental sustainability agenda underscores the importance of a holistic approach that values natural resources and promotes balanced development.

The detailed analysis of the Madonie in Sicily offers an operational approach, proposing potential guidelines for the future. The research suggests technological solutions and strategies to preserve cultural identity applied to the built heritage, counter youth emigration, and promote economic and social development. The comparison with successful case studies worldwide enriches the understanding of the challenges and opportunities. The Atlas of technological solutions and the specific guidelines for the rehabilitation of Polizzi Generosa provide practical tools for implementing sustainable development strategies. The thesis presents itself as a response to current challenges, offering a clear vision for the creation of *Smart Villages* as catalysts for change, with the hope of inspiring communities, institutions, and businesses in promoting the progress of inner regions.

The hope is that this research will inspire not only Italian rural communities but also institutions, businesses, and all those involved in promoting the advancement of inner regions, contributing to a new chapter of growth and prosperity in a context of mutual collaboration.

3. Research questions

In light of the identification of the topic and its growing centrality in recent years, the research has formulated several questions that have shaped the field of investigation, providing a foundation for defining a framework on which to build a second level of inquiries, in order to outline the scope of study and its phases.

Below are the questions that best articulate the issues that have emerged:

1. Considering that the development of inner areas is a widely discussed topic within the scientific community and represents a central issue for interdisciplinarity, how should the development of small towns be addressed and reinterpreted?
2. Is it possible to identify the main critical issues currently affecting small towns in order to interpret widespread phenomena such as depopulation, service desertification, and abandonment? Furthermore, is it possible to recognize that small towns are simultaneously reserves rich in value?
3. Small centers are often considered secondary elements, referred to as "villages" in a suggestive way. Is it therefore possible to consider them as fundamental components of the social, cultural, and economic network of the country?
4. How have territorial policies in recent years considered small towns? Is it possible to outline a project for these areas and, based on this, imagine future lines of action that benefit from past experiences?
5. Several urban regeneration experiences are currently impacting the small towns of the country. How can these phenomena be analyzed and interpreted, drawing on the lessons learned from these experiences?

6. How have local administrations, designers, and *stakeholders* approached this issue, especially in recent years? Is it possible to identify a procedural model in the revitalization efforts of small towns? How have social, cultural, and economic practices (including unconventional ones) evolved?
7. Is it possible to hypothesize an interpretative model that could outline territorial vocations in order to imagine actions tailored to the places and their specific characteristics?

The research aims to answer these questions, focusing primarily on the inner territories and small towns in southern Italy, with particular attention to the Madonie Park area as a case study to investigate.

As a final question, the following summary question is posed:

What operational approach can be outlined to bridge the social, economic, and cultural gaps between inner territories and the rest of the country? How can the rehabilitation of existing architecture, and thus the role of architectural engineering, generate a radical change in these territories?

4. Research objectives

To address the aforementioned questions, this research aims to outline objectives that contribute to the development of an initial operational model, advancing the topic of regeneration and enhancement of inner territories and small towns. This has been achieved through the formulation of solutions capable of addressing and mitigating existing challenges, such as demographic decline, abandonment, physical and social degradation, as well as the decommissioning of heritage, by developing guidelines aimed at guiding administrations, communities, businesses, and local *stakeholders* in the valorization and promotion of local identities. These strategies seek to optimize costs and services, as well as non-monetary labor, for the benefit of the communities.

The identified strategies are based on solutions capable of activating sustainable repopulation policies for inner territories, introducing new vital functions for urban centers in order to attract new generations and foster coexistence between old and new inhabitants. This process is conceived as the construction of an intermediary society capable of leveraging the opportunities present in the promises of the *Smart Land* and translating them into economic, social, and cultural practices suited to managing the flows.

With these premises in mind, the primary objective of the research is the analysis of the Madonie Park area in Sicily, consisting of 21 communities and/or small towns. Despite the considerable potential of this region, a deficit of autonomy and the lack of an advanced connectivity system emerge, both of which are necessary to adequately valorize the endemic resources in architectural, social, gastronomic, and cultural terms.

The specific objectives undertaken by the research include: identifying smart policies to be proposed to local administrations in order to find a unified and community-based approach; understanding, through SWOT analysis, the strengths and weaknesses of the area and, more specifically, of its smaller centers; promoting and achieving sustainable development goals; facilitating innovation through the technological development of the existing built heritage and improving accessibility to places and sites; making rural areas dynamic and increasing their competitiveness; supporting generational turnover and encouraging repopulation; initiating a transnational exchange at the European level; implementing policies of exchange and mutual learning between small centers to better define their qualification as *Smart Villages*; raising awareness for a smart policy; creating a network of *Smart Villages* in the Madonie Park, involving external *stakeholders*; creating guidelines useful for the implementation of interventions aimed at architectural/landscape, technological, and social regeneration.

In addition to this:

1. clarify the concept of local development, with particular attention to differentiated approaches in relation to inner territories, through a stu-

dy that highlights the main characteristics of each approach;
2. build an overview of the main issues affecting inner areas and small towns, outlining their values and challenges;
3. read and interpret the opportunities arising from local development policies in recent years, with a focus on the "dimensions of the project" for inner areas, aiming to harmonize the various action parameters;
4. research and analyze experiences of rehabilitation and enhancement of small towns, in order to build a cognitive and interpretative model that can serve as a metric for the development of future operational approaches;
5. apply interpretative filters to the fragilities and values, constructing a model of territorial capital and applying it to the marginal context of the Madonie in Sicily;
6. build an operational model that outlines possible future actions to address disparities in inner areas, ensuring a strategic approach and a coordination system between the different levels of policies and actions already in place.

Furthermore, the research aims to achieve potential outcomes:

- On a disciplinary level, by providing a critical analysis and offering *insights* on the rehabilitation and enhancement of inner areas and small towns, as well as on local development;
- on territorial *governance*, through the proposal of atlases and guidelines that reframe urban centers as active components of the territorial system, rethinking the tools for a multi-level *governance* that guides the coordination between local and territorial authorities;
- on urban regeneration of small towns, offering guidelines aimed at promoting repopulation and enhancement, with general actions to be proposed, adapted, and tailored to fragile territorial contexts.

The SNAI (National Strategy for Inner Areas) identifies the residents of small towns as "custodians of the territory," assigning them the responsibility of preserving and nurturing the sense of identity. Thus, the research becomes an opportunity to raise awareness among new generations, activating social resilience within the communities of small towns. Based on the principles of identity and resilience, but above all rehabilitation and enhancement, actions aimed at forming collaborative networks of *smart* and sustainable *villages* are designed to engage with the real lives of communities, implementing opportunities for sustainable development. The ultimate goal of the research is to identify potential actors and future beneficiaries, fostering cooperation based on the results obtained, in order to build possible future scenarios.

This thesis aims to explore the feasibility and implementability of a revitalization process, with a particular focus on the Sicilian landscape, concentrating on the twenty-one small municipalities of the Madonie Park and their vibrant communities. The core of this research is an ode to innovation and opportunity, seeking to revive those remote corners of Italy and Sicily that embody the essence and authenticity of our nation. The goal is to awaken communities at risk of oblivion, to challenge the stagnation of places where progress seems like an insurmountable challenge, to promote economic and social development, while preserving cultural roots, architectural peculiarities, and the unique social fabric of these lands, and to foster the promotion of local identity. It aims to enhance architecture, not only fueling the economy but also strengthening the community's identity, creating a Madonie district that serves as a beacon for technological and digital innovation.

Improving accessibility, promoting digitalisation, and countering demographic decline are key aspects of the proposal, as well as enhancing the connection between vital centers and the peripheries, reversing the spiral of demographic decline, and attracting young people and new families to return to their roots, fostering a new life in the inner areas.

The research promotes an environmental sustainability agenda, enhancing natural resources and aiming to bridge the gap between rural regions and modern *Smart Cities*. The goal is to improve services and create an interconnected network of opportunities for balanced progress.

Technological analysis and social innovation are integral parts of the investigation, with a focus on pillars such as digital infrastructure, optimizing energy use through the establishment of energy communities, promoting sustainable mobility, and fostering social innovation. The research seeks to identify technological solutions tailored to the specific needs of Sicilian rural communities.

Thanks to an internship at the Soprintendenza BB.CC.AA. of the Province of Palermo, the research gains a deep understanding of territorial dynamics, contributing to guidelines and *best practices* to streamline bureaucratic processes. The study experience in Spain provides an international perspective, enriching the available tools through learning from innovative initiatives and revitalization strategies of a city already known for its successes.

The output of the research project is the creation of an Atlas of technological solutions for *Smart Villages* in the Madonie, along with specific guidelines for the rehabilitation and enhancement of the municipality of Polizzi Generosa.

Ultimately, this research represents an odyssey of opportunities, merging tradition and innovation to fuel the vitality of rural regions. The objective is to provide tangible recommendations so that the *Smart Villages* envisioned for the Madonie Park become catalysts for change, transforming fragile economies into thriving communities capable of adapting, sharing, promoting current living conditions, and prospering.

5. Research methods and tools

The methodology adopted for this research is structured as a systematic and multidisciplinary approach, aimed at exploring and outlining innovative solutions for the revitalization of Italy's inner areas, with particular focus on the Sicilian context, concentrating on the twenty-one small municipalities of the Madonie. Through the use of a preliminary analytical approach followed by an interpretive phase, this research aims to formulate *best practices* and guidelines for the processes of regeneration and enhancement of small towns, using the Sicilian territory of the Madonie as a case study.
The approaches adopted during the research process are distinguished as follows:

Analytical approach:

- definition of the scope of investigation through critical exploration of scientific approaches and relevant literature;
- reconstruction of the state of the art and regulations regarding themes of regeneration and local development in inner areas;
- investigation of the case study of the Madonie.

Interpretive approach and method construction:

- critical reading and interpretation of experimental cases related to revitalization and enhancement interventions for small towns;
- analysis of the approaches and principles underlying regeneration processes;
- construction of a knowledge/interpretive framework of the Madonie area through the creation of a system that reflects the current and trend-based situation, including the selection and interpretation of relevant data to develop potential intervention strategies.

Deductive and propositional approach:

- identification/deduction of the field of action through the development of tools aimed at reactivating inner areas and regenerating

small towns.

The research adopts a methodology based on both qualitative and quantitative approaches, proposing their hybridization and coexistence. The qualitative approach is considered a dynamic process, where research does not follow a sequence of predefined procedures but rather involves a complex interaction between the conceptual and empirical worlds. In the case of quantitative research, the method is structured in sequential logical phases, with a deductive approach in which observation is preceded by theory, moving within the context of justification through empirical data. The methodological approach for constructing the bibliographic framework is based on the development of a reasoned bibliography, identifying macro-themes that generate the main sections of the research. The research process follows a dynamic and non-linear structure, highlighting a reading between the dimensions of inner areas and small towns, both explicitly and implicitly, in the various sections of the research.

The first phase of the investigation consisted of a thorough analysis of the strategies and regulations governing rural areas at the extra-European, European, and Italian levels. This approach allowed for the development of a detailed framework of the socio-economic dynamics and specific challenges characterizing inner areas. In parallel, a careful analysis of successful international case studies was conducted, focusing on *Smart Villages* that have thrived in various parts of the world. This comparative study provided a broad perspective on the strategies, technologies, and innovations that have contributed to the revitalization of rural communities, addressing challenges similar to those encountered in the Madonie.

Subsequently, a detailed analysis focused on commercially available and experimental technologies, as well as strategies to enhance the areas under study. From digital infrastructure to energy optimization, from promoting sustainable mobility to managing natural resources and fostering social innovation, and from architectural heritage rehabilitation to accessibility, the goal was to identify technological solutions that align with local needs and specific challenges. The key objectives of the research were to create a harmonious balance between tradition and innovation, challenging the economic and social inertia of inner areas. The promotion of *Smart Villages* was adopted as the main strategy, centered on the fusion of technology and local identity traits, thus contributing to the economic and social development of the Madonie.

The field experiences, including the internship at the Soprintendenza BB.CC.AA. of the Province of Palermo and the study in Spain, have enriched the research with a practical perspective. Direct interaction with local communities and institutions allowed for the authentic adaptation of strategies, as well as the provision of guidelines and *best practices* to streamline bureaucratic processes. The culmination of the research project is the creation of an Atlas of technological and sustainable solutions specific to the Madonie, aimed at the establishment of *Smart Villages*. Additionally, detailed guidelines were formulated for the rehabilitation and enhancement of the municipality of Polizzi Generosa, serving as a pilot case among the 21 analyzed in the Madonie Park. In summary, the methodology adopted integrated in-depth theoretical research with practical experiences, aiming to offer tangible recommendations and a clear vision for the creation of *Smart Villages* capable of catalyzing change, promoting the vitality and prosperity of rural communities in the Madonie and, potentially, throughout Italy and Europe worldwide.

6. State of the art and elements of originality

The current context of the proposed research fits within a framework of growing recognition of the importance of Italy's inner areas, especially considering the socio-economic dynamics that have recently characterized them. At this moment, the attention towards these regions is amplified both at the national and European levels, with particular relevance within the

SNAI (National Strategy for Inner Areas) and the PNRR (National Rehabilitationand Resilience Plan).

In the current landscape, the discussion on innovation and opportunity in rural areas is constantly growing. The emergence of the concept of *Smart Villages* assumes particular relevance, outlining a modern perspective and vision that emphasizes the importance of integrating technology and innovation without compromising local identity and tradition.

The analysis of strategies and regulations at the extra-European, European, and Italian levels highlights the complexity of the regulatory framework and provides a solid foundation for understanding the dynamics that influence rural areas. The evaluation of successful case studies, both globally and in specific Italian and European contexts, adds an important layer of knowledge to the research, offering practical *insights* and solutions already implemented in similar settings.

The National Rehabilitationand Resilience Plan, which follows the National Strategy for Inner Areas, plays a key role in addressing the challenges faced by Italy's inner regions. Territorial development policies and the allocation of targeted financial resources represent a concrete response to the needs of these areas. The centrality given to inner areas in national strategic documents reflects the recognition of the importance of investing in these regions to ensure sustainable and balanced development across the entire country. The promotion of *Smart Villages* aligns with the objectives set out by the PNRR, which aims to stimulate economic development, environmental sustainability, and social inclusion. In this context, the research approach, which emphasizes the enhancement of local identity through innovation, is in line with the directions outlined by government programs.

The uniqueness of this research lies in its focus on the Madonie, a specific context that serves as a microcosm to explore the connection between innovation and tradition. The challenge of the static nature of rural areas is boldly addressed, encouraging a dialogue between the past and the future, tradition and technology. The multidisciplinary approach, encompassing cultural, social, and economic aspects, is a distinctive element that enriches the field of research in this area.

The detailed analysis of technologies and specific strategies worldwide applicable to the Madonie, combined with field experiences and internships at key institutions, adds a practical and pragmatic dimension to the research. The creation of an Atlas of compatible and sustainable technological solutions, along with the Guidelines for the rehabilitation of Polizzi Generosa, represents a tangible contribution for local administrations, citizens, businesses, and associations in implementing sustainable development strategies. This research holds significant relevance within the current national and European dynamics, contributing with originality and pragmatism to the discussion on the future of Italy's inner areas, promoting the creation of networks and *Smart Villages* capable of revitalizing and enhancing local communities.

7. Target audience of the Research

The doctoral research is aimed at various target groups in order to maximize its scope and impact. The main target groups are:

- **Academies and Research Institutions:** The doctoral research aims to contribute to the academic and scientific debate in the fields related to territorial regeneration, local development, and the enhancement of small towns. Universities, research institutes, and academics are invited to evaluate and incorporate the new perspectives, methodologies, and approaches proposed in the research, promoting the Third Mission;
- **Public Administrations:** Local, regional, and national authorities, as well as public institutions, represent an important target audience. The guidelines proposed by the research can be used to guide public policies and contribute to the formulation of targeted strategies for the regeneration of inner areas and small towns;

- **Local Community:** Local communities, particularly those in rural areas and small towns, are key beneficiaries. The research aims to raise awareness and actively engage communities in the regeneration process, promoting participation and collaboration for an inclusive and sustainable approach;
- **Stakeholders and Local Actors:** Local businesses, non-governmental organizations, cultural associations, and other local actors are called upon to consider and implement the strategies proposed by the research. Cooperation with these *stakeholders* is essential for the practical implementation of the proposed initiatives;
- **Scholars and Researchers:** The research provides a significant contribution to the training of new researchers and scholars interested in the themes of territorial regeneration and local development. They can draw inspiration from the methodology and findings of the research for further investigations and insights;
- **General Public:** Finally, the research aims to inform the general public, raising awareness on critical issues related to territorial regeneration, the enhancement of small towns, and local development. Clear and accessible communication allows for engaging a wider audience and spreading awareness on these topics.

8. Potential future developments

Looking ahead, the research aims to explore further avenues for the development and implementation of *Smart Villages* in the inner areas of Sicily, with a particular focus on the Madonie region. It also seeks to expand the same methodology to other Sicilian and non-Sicilian contexts, either by analogy or by contrast. One of the possible future developments could involve a deeper exploration of the relationships and synergies between the various smaller towns within the Madonie, with the goal of creating an interconnected and collaborative network of *Smart Villages*. This could be facilitated through the implementation of pilot projects that promote the exchange of resources, knowledge, expertise, and experiences among communities.

Actively and more extensively involving the local youth in decision-making processes and in the development of strategies for *Smart Villages*. This could be achieved through educational and training programs that encourage youth entrepreneurship, innovation, and civic participation. Engaging young people would not only ensure a greater diversity of perspectives and ideas, but it could also help counteract youth emigration and keep rural communities alive, giving new life to communities too rooted in the past.

Exploring the implementation of advanced technological solutions, such as artificial intelligence and the Internet of Things, to improve the efficiency of public services, resource usage, and quality of life in rural areas. These technologies could be used to optimize waste management, enhance sustainable agriculture, ensure infrastructure security, and promote responsible tourism.

Finally, it could be beneficial to establish partnerships and collaborations with public entities, academic institutions, private businesses, and non-governmental organizations to support and fund the implementation of *Smart Villages*. This could include seeking national, European, and international funding for local development projects, as well as creating networks of support and knowledge exchange among interested parties.

The future of *Smart Villages* in the Madonie and beyond will depend on the ability to successfully adapt and implement the strategies outlined in the research, as well as the willingness and commitment of local communities, institutions, and various *stakeholders* to work together for the progress and sustainability of the Sicilian rural areas.

Fig. I | A tree-lined avenue leads to the village of Petralia Soprana © Nicola Pulham, 2018

Chapter I

THE DEVELOPMENT OF INNER AREAS THROUGH THE CREATION OF *SMART VILLAGES*, A SHARED PROJECT

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Chapter I
Abstract

IT

Il presente capitolo fornisce un'analisi esaustiva degli *Smart Villages* a livello globale, europeo e nazionale, focalizzandosi sull'integrazione di strategie sostenibili e innovative per la promozione e lo sviluppo territoriale. Una particolare attenzione è dedicata all'implementazione della transizione digitale e a un approccio innovativo al territorio come motori principali per il progresso delle comunità rurali.

Nella prima sezione, vengono presentati casi studio extraeuropei, europei e italiani di *villaggi intelligenti* riscontrati nella letteratura scientifica e nelle fonti divulgative e generaliste che hanno adottato con successo strategie innovative. Questi casi rappresentano esempi concreti di come l'integrazione di soluzioni digitali e sostenibili abbia contribuito alla rinascita delle aree interne, fungendo da ispirazione per il contesto di studio specifico. La metodologia proposta mira all'estrapolazione di strategie vincenti da questi casi studio e alla loro adattabilità nell'area oggetto di ricerca.

Successivamente, al fine di ricondurre la ricaduta di queste nel caso studio scelto, e dunque, nel caso italiano lo studio analizza la normativa vigente, le strategie nazionali ed europee a supporto della rivitalizzazione dei *villaggi intelligenti*. Questa seconda sezione fornisce una comprensione approfondita delle dinamiche che possono essere intraprese, delineando i progetti, le iniziative chiave e i fondi per la rivitalizzazione dei centri minori. L'obiettivo è quello di fornire un quadro normativo e strategico che guidi lo sviluppo di politiche locali orientate al benessere delle comunità rurali, con un'enfasi particolare sulla sinergia tra innovazione tecnologica e sostenibilità ambientale, nonchè compatibilità tecnologica.

Il capitolo inaugura il percorso di studio delineando le esperienze internazionali e nazionali di successo, fungendo da fondamentale cornice concettuale per la definizione di strategie innovative e sostenibili destinate a plasmare il futuro delle comunità rurali *villaggi intelligenti* con una ricaduta sulle aree interne siciliane.

EN

This chapter provides a comprehensive analysis of Smart Villages at the global, European, and national levels, with a focus on the integration of sustainable and innovative strategies for territorial promotion and development. Particular attention is given to the implementation of digital transition and an innovative approach to territorial management as primary drivers for the progress of rural communities.

The first section presents case studies of Smart Villages from outside Europe, within Europe, and in Italy, identified through scientific literature and general sources. These villages have successfully adopted innovative strategies, offering concrete examples of how the integration of digital and sustainable solutions has contributed to the revitalization of inner areas. These cases serve as inspiration for the specific context under study. The proposed methodology aims to extract successful strategies from these case studies and assess their adaptability to the research area.

Subsequently, in order to apply these findings to the chosen case study—specifically within the Italian context—the research analyzes current legislation, as well as national and European strategies supporting the revitalization of Smart Villages. This second section provides a detailed understanding of the dynamics that can be undertaken, outlining key projects, initiatives, and funding opportunities for the revival of small centers. The aim is to offer a regulatory and strategic framework to guide the development of local policies focused on the well-being of rural communities, with particular emphasis on the synergy between technological innovation, environmental sustainability, and technological compatibility.

This chapter sets the foundation for the study by outlining successful international and national experiences, serving as a critical conceptual framework for defining innovative and sustainable strategies. These strategies are intended to shape the future of rural communities and Smart Villages, with specific impacts on Sicily's inner areas.

ES

Este capítulo ofrece un análisis exhaustivo de los Smart Villages a nivel global, europeo y nacional, centrándose en la integración de estrategias sostenibles e innovadoras para la promoción y el desarrollo territorial. Se presta especial atención a la implementación de la transición digital y a un enfoque innovador hacia la gestión del territorio como motores principales para el progreso de las comunidades rurales.

En la primera sección se presentan estudios de caso de Smart Villages en contextos extraeuropeos, europeos y en Italia, identificados en la literatura científica y en fuentes divulgativas generales. Estos casos han adoptado con éxito estrategias innovadoras, representando ejemplos concretos de cómo la integración de soluciones digitales y sostenibles ha contribuido a la revitalización de las áreas interiores. Estos casos sirven como fuente de inspiración para el contexto específico de estudio. La metodología propuesta busca extraer estrategias exitosas de estos casos y evaluar su adaptabilidad al área de investigación.

Posteriormente, con el objetivo de aplicar estos resultados al caso de estudio elegido—específicamente dentro del contexto italiano—la investigación analiza la normativa vigente, así como las estrategias nacionales y europeas de apoyo a la revitalización de los Smart Villages. Esta segunda sección ofrece una comprensión detallada de las dinámicas que pueden ser emprendidas, destacando proyectos clave, iniciativas y fondos destinados a la revitalización de los pequeños centros urbanos. El objetivo es proporcionar un marco normativo y estratégico que guíe el desarrollo de políticas locales orientadas al bienestar de las comunidades rurales, con un énfasis particular en la sinergia entre innovación tecnológica, sostenibilidad ambiental y compatibilidad tecnológica.

Este capítulo inaugura el recorrido del estudio al delinear experiencias internacionales y nacionales exitosas, sirviendo como un marco conceptual fundamental para la definición de estrategias innovadoras y sostenibles. Estas estrategias están destinadas a moldear el futuro de las comunidades rurales y los Smart Villages, con un impacto específico en las áreas interiores de Sicilia.

THE DEVELOPMENT OF INNER AREAS THROUGH THE CREATION OF *SMART VILLAGES*, A SHARED PROJECT

In the modern era, technological evolution has led to a profound change in the conception of cities, giving rise to *Smart Cities*. These have developed greater intelligence, transforming in response to the need to adapt to the present. Initially, they were conceived as urban centers where information and communication technologies were integrated to improve the quality of life for citizens. This approach led to the optimization of public services, efficient resource management, and increased environmental sustainability. The term *"Smart City,"* which has gained popularity in recent years, refers to cities that use technology and innovation to improve efficiency, service quality, and sustainability, while also focusing population in areas where services are greater and more efficient. However, rapid urbanization and the concentration of resources in large cities have also highlighted significant challenges, such as pollution, traffic congestion, and social stress[1]. These challenges have prompted an expansion of perspective, leading to the conceptual evolution from *Smart City*[2] to *Smart Land* (Bonomi et al., 2014).

The transition to *Smart Land* reflects a broader vision that considers not only cities as epicenters of innovation but also rural areas as an integral part of a socio-technological ecosystem (Organization for Economic Cooperation and Development - OECD, 2016). This shift in perspective is driven by the goal of creating a balance between urban and rural development, embracing a range of key concepts, including::

- **rural regeneration:** it promotes the rehabilitation and enhancement of rural areas, which have often been neglected in favor of cities. Through investments in digital infrastructure, smart agriculture, and sustainable tourism, rural communities can regenerate, becoming centers of innovation and development (Bonomi et al., 2014);
- **smart rural villages:** hey represent a new approach to living, where technology is used to improve the quality of life in rural contexts. Access

Fig. I.1 | Confronto aree urbane e rurali © Luisa Lombardo, 2023.

[1] *"A systemic study conducted by designers and technicians for large cities, capitals, metropolitan areas, and small villages in the planning of basic services, e-governance, land use, urban density, infrastructure, mobility, and efficient networks, integrated urban uses, public spaces, green infrastructures, public service systems, and much more, becomes a necessary and indispensable condition. The smart city, therefore, aims to create a compact, connected, socially inclusive, and resilient map that meets the needs of everyone. A city that harnesses the power of technology, data, and innovation to improve quality of life and to coordinate and integrate urban management sectors that have long needed innovation. We should begin analyzing individual cities in terms of their sustainability, focusing on the "needs" that would enable us to plan and program in a hierarchical, cross-sectoral way, aiming for balance between population and territory, with the goal of improving conditions. Today, in the digital age, where data travels at the speed of light, paradoxically, life seems to slow down again, with a return to the past projected into the future, where the pleasure of having lunch at home becomes the norm once more, thanks to a new work mode called "home-based." The Smart City, in its terminological sense, i.e., "Intelligent City," a term that creates a broad and undefined definition, leaves space for the elaboration of boundaries that cannot be fully defined, as they are still in the process of definition."* Agrosi G. (ed.) The Smart City and the Comfortable City: A New Futuristic "Smartian" Reality. Mimesis Edizioni, 2022.

[2] It is the collective ideal of the city of the future. An urban area where, through the use of digital technologies and technological innovation, it is possible to optimize and improve infrastructure and services for citizens, making them more efficient. *"The smart city is a set of urban planning strategies aimed at optimizing and innovating public services to connect the city's infrastructure with the human, intellectual, and social capital of its inhabitants through the use of new technologies."* LUMI4innovation. (2020). Smart city: What it is, how it works, features, and examples in Italy. Retrieved December 16, 2024, from https://www.lumi-4innovation.it/smart-city-cose-come-funziona-caratteristiche-ed-esempi-in-italia/

to advanced digital services, efficient energy management systems, and sustainable mobility solutions can transform these villages into vibrant and resilient communities (OECD, 2018);

- **widespread connectivity:** a fundamental element that reduces the digital divide between cities and rural areas. Access to high-speed internet and mobile coverage is essential to ensure that rural communities can fully benefit from technological opportunities (UN-habitat, 2019);
- **integrated sustainability:** promoting eco-friendly agricultural and industrial rehabilitation practices and encouraging the conservation of the natural environment and traditional architecture. This creates a balance between economic growth and environmental preservation (World Economic Forum, 2018);
- **circular economy:** waste produced is minimized, reused, and resources are used more efficiently, fostering the creation of self-sufficient communities (Gonzalez-Alvarez et al, 2017) not only in terms of disposal but also their reuse in daily life, such as in the construction field.

The evolution from the concept of *Smart City*[3] to that of *Smart Land* represents a step forward in building a sustainable and inclusive future[4]. The promotion of smart rural villages and the enhancement of rural areas not only balance urban development but also embrace the very essence of the connection between humans and the environment, creating a balance between the advantages and disadvantages that characterize them (*Fig. 2*). This transition represents a new frontier of living, where technology, sustainability, and community converge to create a more balanced and harmonious world (Costa L.SC. et al, 2019).

The metamorphosis from *Smart City* to *Smart Land*[4], first proposed by Professor Roberto Masiero in 2014[5] (Bonomi et al., 2014) for the Italian context, represents an innovative and significant approach in the field of territorial development and opens new opportunities for the small marginal areas of our Country. The concept reflects a shift in perspective, moving the focus not only from cities but also towards rural areas and less densely populated territories, such as the outskirts or the inner villages of the Alpine and Apennine regions. This transition, which is widespread throughout Europe, aims to promote harmonious and balanced development, embracing the entire geographical and social landscape, without excluding any part of it (Antonelli, 2019).

It is, in fact, equally crucial to pay attention to small urban centers on the outskirts, along with rural areas, which constitute a significant part of the Italian and European territory[6]. Thanks to technology and increased environmental awareness, wide opportunities have opened up for the smart

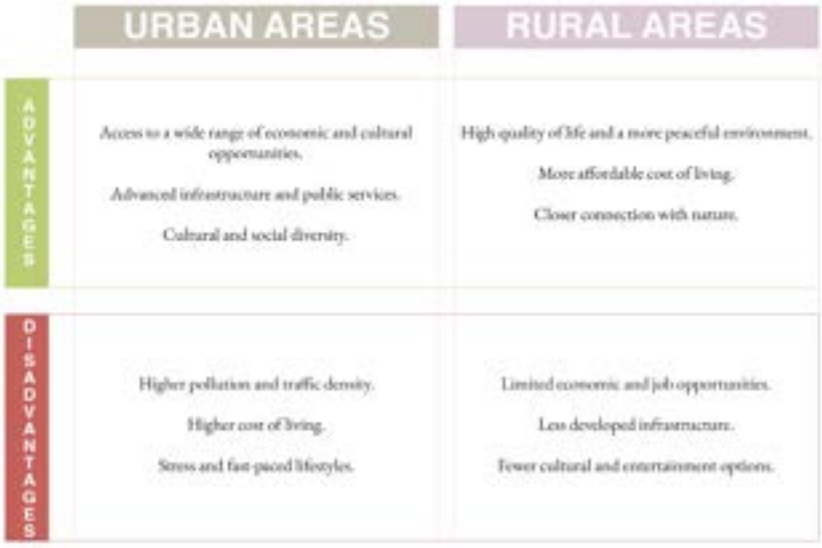

Fig. I.2 | Vantaggi e svantaggi aree urbane e rurali in Italia, © Luisa Lombardo, 2023.

[3] *"To date, there is no single definition of a Smart City. In fact, the programmatic guidelines for the general conditions of the smart city find their common denominator in terms that are shareable on a community-global level, which then become personalized within their generative identity, shaped by the idea of a smart city through the specific conditions dictated by the territory. In summary, the smart city aims to create a compact, connected, socially inclusive, and resilient urban environment that meets the needs of all. A city capable of harnessing the power of technology, data, and innovation to improve the quality of life for residents and to coordinate and integrate urban, territorial, and environmental management sectors. In one word: "Sustainable City," a true revolution. A city model that will produce its new historical identity, strongly connected to the past, as it is the product of it, but with a futuristic edge. This gives rise to the need for a trade-off process within a vision of re-planning the continuum of past, present, and future, which will enable the overcoming of the current situation and lead to an unprecedented evolutionary condition, certainly unknown"* Agrosi G. (edited by) The Smart City and the Comfortable City. A New "Smartian" Futuristic Reality. Mimesis Edizioni, 2022

[4] Bonomi A., Masiero R. (2014), From Smart City to Smart Land, Agenda Marsilio Editore, Padua.

[5] Fondazione Francesco Fabbri, https://www.fondazionefrancescofabbri.it/it/about/governance/roberto-masiero/

development of these territories. It has emerged that digital innovation can bring considerable benefits to rural centers, enhancing services and preserving distinctive features, combining tradition and innovation. It is also important to note that these European inner areas host around 93 million citizens[3], making it essential to promote smart development.

Masiero argues that focusing solely on urban development could lead to an imbalance between urban and rural areas, risking the marginalization of the latter. The proposal of *Smart Land* (*Fig. 3*), however, is based on the idea that technological innovation should spread uniformly across the entire territory, including both cities and rural areas (World Bank, 2019). This approach aims to leverage the potential of rural communities, preserving their traditions and enhancing local resources through the adoption of technological and innovative solutions. Cities thus become a fundamental support for small urban centers, bridging the existing *gap*[7]. They thus help in the enhancement of local resources and heritage in general, preventing overcrowding in certain centers, now defined as critical, compared to others that are less populated and subject to depopulation. However, this involves several aspects, including:

- provide access to information and communication technologies (ICT) such as high-speed connectivity and *IoT* (Internet of Things) solutions (U.N., 2020);
- apply technological solutions to promote environmental sustainability, such as the use of renewable energy and eco-sustainable agricultural practices, enabling rural communities to develop in an eco-compatible manner;
- enhance the traditions and cultural heritage of rural areas, preserving their unique identity while embracing innovation;
- implement sustainable mobility solutions in rural areas, such as eco-friendly public transport and infrastructure for soft mobility, contributing to accessibility and connectivity;
- actively involve local communities in the development of strategies and projects, promoting collaboration and the sharing of ideas;
- foster the development of new local businesses and job opportunities, utilizing existing resources and creating new economic prospects.

The perspective of the *Smart Land* represents a great opportunity to reduce imbalances between urban and rural areas, creating a more balanced social and economic fabric. Promoting innovation and the adoption of technologies in all territorial regions could lead to sustainable and inclusive progress for the entire national community, and this model could be replicated and expanded both in Europe and overseas. This concept of *Smart Land* takes shape, later in Europe, in the form of *Smart Villages* (Antonelli, 2019), which combine information and communication technologies (ICT) with the picturesque and remote rural areas, villages, smaller towns, and countryside. To better understand them, we can simplify the concept by comparing it to the idea of a *Smart City*, where technology and digital innovation enhance sustainability, services, information, and the use of innovative strategies (European Commission, 2017).

The goal of *Smart Villages* is to improve various aspects related to daily life by expanding the possibilities of rural areas, including energy efficiency, connectivity, access to services, resilience, security, environmental protection, citizen participation, and the adoption of new sustainable business, work, and mobility models, supported by active and essential local participation (MC Kinsey Global Institute, 2019).

The industrial revolution of the 20th century, as well as the COVID-19 pandemic, have re-evaluated S*mart Villages* since 2020. This invites reflection on their promotion, fostering a high quality of life and adopting a circular economy instead of indiscriminate global resource consumption. The goal of this paradigm shift is to promote the endogenous resources of the territory, which are more abundant in these areas, and to offer economic value that is currently largely absent or still underappreciated (European

[6] In Europe, predominantly rural areas make up 45% of the total area, but they are inhabited by only 21% of the European population. (Eurostat, 2020)

[7] "*Our country is among the most visited in the world, not only for the beauty of our historical centers—Roman, Romanesque, Gothic, Baroque, Liberty, and Art Deco—but also for the warmth of our traditions, which stand in contrast to globalization. This is why we must re-recognize and reclaim our "local identity," considering recent global technological transformations as an opportunity for the evolutionary growth of an improving system. In large cities, for example, we are forced to coexist with a population far beyond the land's capacity, creating social disorder that is both demoralizing and confusing. The almost total absence of green spaces and harmonious places affects and alters the natural state of human beings, leading to the need for redesigning, or rather restoring (in the sense of a restyling) the city, transforming it into a smart city with Vitruvian proportions and Palladian rhythm. We should draw inspiration from the functioning of the perfect machine that exists in the world: the human body and its chakras, the nerve centers of energy and physical function. Similarly, we must conceive of the smart city and its chakras, based on the functioning of urban and environmental nerve centers in synergy with human beings and in a synchronically balanced intersectoral territorial-connective relationship.*" Agrosi G. (edited by) The Smart City and the Comfortable City. A New Futuristic "Smartian" Reality. Mimesis Edizioni, 2022.

Commission, 2015). However, it is essential to properly redevelop and revitalize rural villages that have fallen behind in terms of progress.

This includes strengthening infrastructure and telecommunications, network coverage, expanding *Wi-Fi* zones, producing sustainable energy, ensuring sustainable mobility, and revitalizing existing structures—lands that have been left behind in time and victims of the encroachment of large cities. These changes inevitably lead to the strengthening of the tourism sector, considering new strategies like smart working, which is key to increasing both demand and supply. This could, for example, transform vacation homes into true residences for remote workers or, even better, digital nomads. Similarly, the concept of living and urbanity changes, encouraging investment to shift toward peripheral areas in order to create a network of *smart villages* that attract labor, professionals, families, and businesses.

Cutting-edge communities that foster collaboration and connections, involving various *stakeholders*, both public and private, and promoting projects that would otherwise be unachievable, without necessarily having a specific administrative connotation (Barbieri et al., 2018). Unlike cities, the-

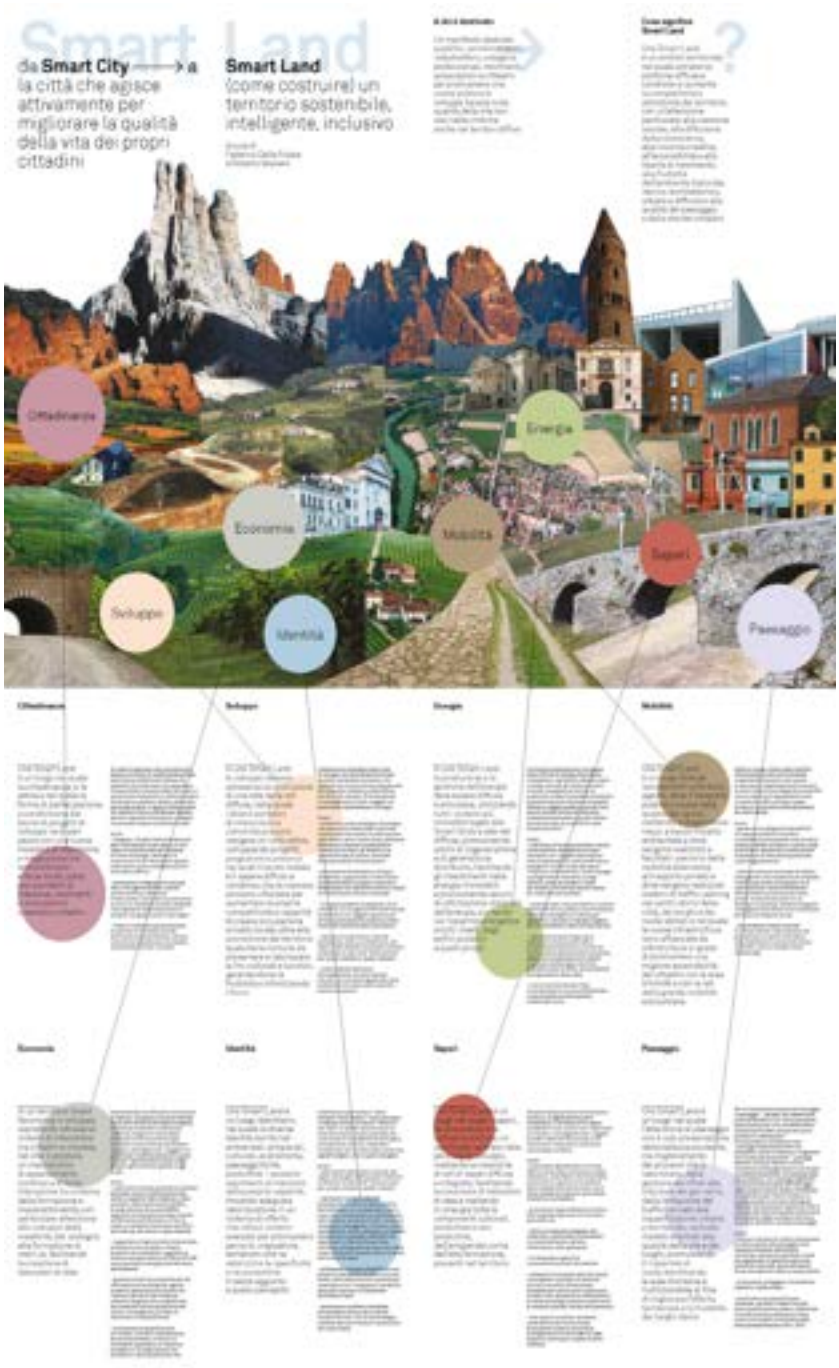

Fig. I.3 | Manifesto of the Smart Land, Roberto Masiero in From Smart City to Smart Land, 2014.

The history of ideas traces unpredictable trajectories: the concept of Smart Land, developed in 2012 by Roberto Masiero and the Francesco Fabbri Foundation, placed territories and people at the center of development, giving rise to multiple applications and inspiring European policies focused not only on smart cities but, above all, on *smart communities*. A shared success, the result of collective intelligence and converging visions, which continues to guide reflections and innovations.

[8] Agency for Territorial Cohesion, "Agenda 2030 for Sustainable Development", https://www.agenziacoesione.gov.it/comunicazione/agenda-2030-per-lo-sviluppo-sostenibile/

se can benefit from collaboration between citizens and small towns to gain the same urban opportunities; it is well known that within small territorial contexts, there is a much closer and more familiar neighborhood relationship, essentially a large condominium where the principle of mutual collaboration prevails. The projects to be undertaken must, therefore, vary based on local needs, understand territorial vocations, and develop them, allowing for targeted interventions to address issues such as abandonment and promoting repopulation as an alternative to urban chaos. Investing in the development of connected rural networks and *Smart Villages* is of fundamental importance not only for the Italian context but also for the European one. These areas make up more than half of the European territory, are inhabited by millions of citizens who deserve services and a quality of life comparable to those offered in large cities, and in Italy, they cover more than 60% of the country, hosting a significant portion of the population (ISTAT, 2019)

In order to achieve sustainability goals by 2030 and 2050[8], it is crucial to focus on programs that make a significant contribution to the environment and sustainable development, providing greater flexibility and the opportunity to experiment with new innovative solutions without compromising the landscape and environment. Efforts can be made across various aspects, including the economy, environment, *governance*, lifestyles, mobility, and technology, to promote sustainable development. These are valuable resources that, if properly utilized, can contribute to the transition towards a more sustainable future (European Union, 2018).

Investing in digital connectivity, renewable energy, smart agriculture, and other innovative solutions can promote economic growth, job creation, environmental protection, and improved quality of life in rural communities. Adopting a holistic approach that involves a wide range of *stakeholders*, including local governments, businesses, academic institutions, and the community itself, is essential for developing targeted strategies and projects. (European Union, 2021). The goal, however, is to create *Smart Villages*, networks of villages that keep pace with the times, capable of offering efficient, sustainable, and inclusive services, improving people's lives while preserving the cultural and environmental identity of rural communities (World Bank, 2016), just like the comfortable city that was aimed for with the *Smart City* concept. Dynamic villages where change and technology, strategies and innovations go hand in hand. Innovative solutions to enhance resilience, starting from local strengths and opportunities, with an approach that involves the community in developing strategies to improve economic, social, and environmental conditions. Villages that benefit from collaboration with other communities, both urban but especially rural, and that can be funded both publicly, drawing from European funds, and privately, due to their potential and the principle of mutual collaboration, distinct from unknown citizens. They represent a significant opportunity for improving quality of life, developing a more sustainable and resilient economy (European Commission, 2017). In *Smart Villages*, it is therefore possible to implement a wide range of specific projects, depending on local needs and community characteristics (United Nations, 2017), including examples of such projects.

- **digital infrastructures:** Implementation of high-speed networks and Internet connectivity in rural areas to enable access to digital technologies, promote e-commerce, improve remote education, and facilitate telemedicine, especially due to the frequent lack of healthcare facilities;
- **sustainable energy:** Promotion of renewable and smart energy solutions, such as the installation of solar panels, the use of microgrids, and energy storage systems, to reduce environmental impact and improve energy efficiency in rural communities, ensuring *smart* and innovative buildings;
- **smart agriculture:** Adoption of advanced agricultural technologies, such as precision farming, the use of sensors for crop monitoring, automation of agricultural processes, and the implementation of smart irri-

gation systems to enhance productivity and agricultural sustainability, as well as increased production;
- **sustainable mobility:** Promotion of sustainable transportation solutions, such as carpooling, bike-sharing, electric vehicles, and the implementation of electric vehicle charging infrastructure, to reduce pollution and improve mobility in rural areas;
- **smart services:** Development of advanced digital public services, such as e-government, smart waste management, efficient street lighting, implementation of smart security systems, and the use of home automation solutions to enhance the quality of life in the community;
- **sustainable tourism:** Enhancement of the cultural and natural heritage of rural areas through the use of digital technologies, creation of innovative tourist experiences, implementation of sustainable tourism management systems, and promotion of low environmental impact tourism activities;
- **local economy and entrepreneurship:** Support for innovation and local entrepreneurship through the implementation of coworking spaces, organization of training programs and support for *startup*s, promotion of local production chains, and the creation of collaboration networks between businesses;
- **heritage rehabilitation and enhancement:** Promotion of traditional architecture considering innovation and technological compatibility.

These are just some of the themes and ideas that can be implemented to promote *Smart Villages*, and this thesis aims to analyze them one by one. However, the specificity and diversity of each depend on the needs and resources of the individual communities, as well as the willingness to collaborate among the various *stakeholders* involved. It is important to emphasize that not all of the strategies listed above can be adopted in all contexts, but they can be versatile and promoted in different ways (Al Nuaimi et al., 2018) based on their territorial compatibility. To continue the previous studies (*Fig. 3*), in these years of research, policies supporting "*smart villages*" have been examined, considering international, European, and Italian strategies, and concrete case studies have been provided for a comprehensive view of the work done so far. These studies are able to find innovative and effective solutions to pursue with solid foundations and a well-defined path, taking into account various aspects (*Fig. 4*). The case study sheets, which are included in the appendix of Attachment 1 - Case Study Booklet, are structured documents providing information on specific case studies or concrete examples of *Smart Villages* identified during these years of research through site visits or scientific literature. In the following documentation, tools were used and designed to analyze and present data, results, and conclusions in a clear and systematic manner, considering the details carefully:
- **Introduction:** A *brief* introduction to the case study and its relevance; Description of the context in which the case study took place. This includes information such as the location, the period of time, the parties involved, etc.;
- **Objectives and Methodology:** Specific objectives of the study or case analysis; Description of the method or methods used to collect data, conduct the analysis, and obtain results;
- **Results:** Presentation of the data and results obtained from the case study analysis. You can use charts, tables, and other visual tools to make the results clearer;
- **Themes discussed:** Summary of the main conclusions drawn from the case study;
- **References:** A list of all sources used to gather data or information related to the case study.

Each case study may present variations in its structure, depending on specific needs and context, as well as the availability of information. However, the crucial element is the presentation of information in a clear, consistent, and comprehensive manner in order to obtain solid examples on which to

base the work and the project in the Madonie territory. In the following paragraphs, the theme of *Smart Villages* will be examined as an introduction to fully understand the summary sheets, explanatory examples, and case studies that will support the doctoral research.

Future cities are neither the invisible ones of Italo Calvino nor the visionary ones of Fritz Lang. They are the cities of today, seen and lived in through a more efficient perspective—technological and creative at the same time, and above all, participatory.

Mattei M.G. (2013) "Carlo Ratti. Smart city, smart citizenz."
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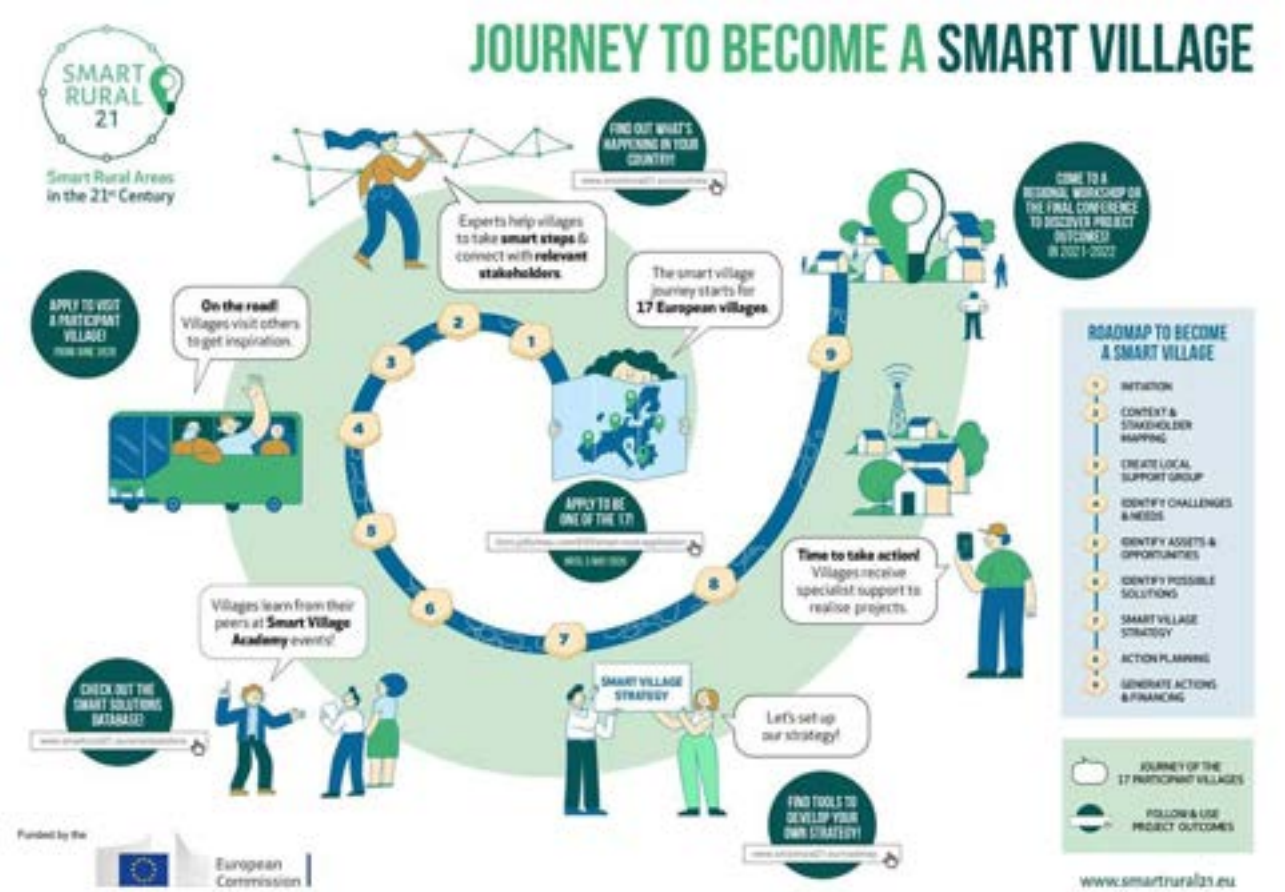


Fig. I.4 | Journey to Becoming a Smart Village © UNCEM - National Union of Mountain Municipalities, Communities, and Authorities 2020.

Although many smart villages have emerged over the past decades, the concept of Smart Villages is relatively recent. It was officially formulated for the first time in 2017 as part of the EU Action for Smart Villages by the European Commission, initiated by the European Parliament. Between 2018 and 2019, the European Commission launched the Pilot Project on Smart Eco-Social Villages, aimed at providing a comprehensive definition of Smart Villages and identifying best practices and relevant case studies. It is important to note that each Member State can adopt its own definition of Smart Villages, adapting it to the national context while following a common framework as outlined above.

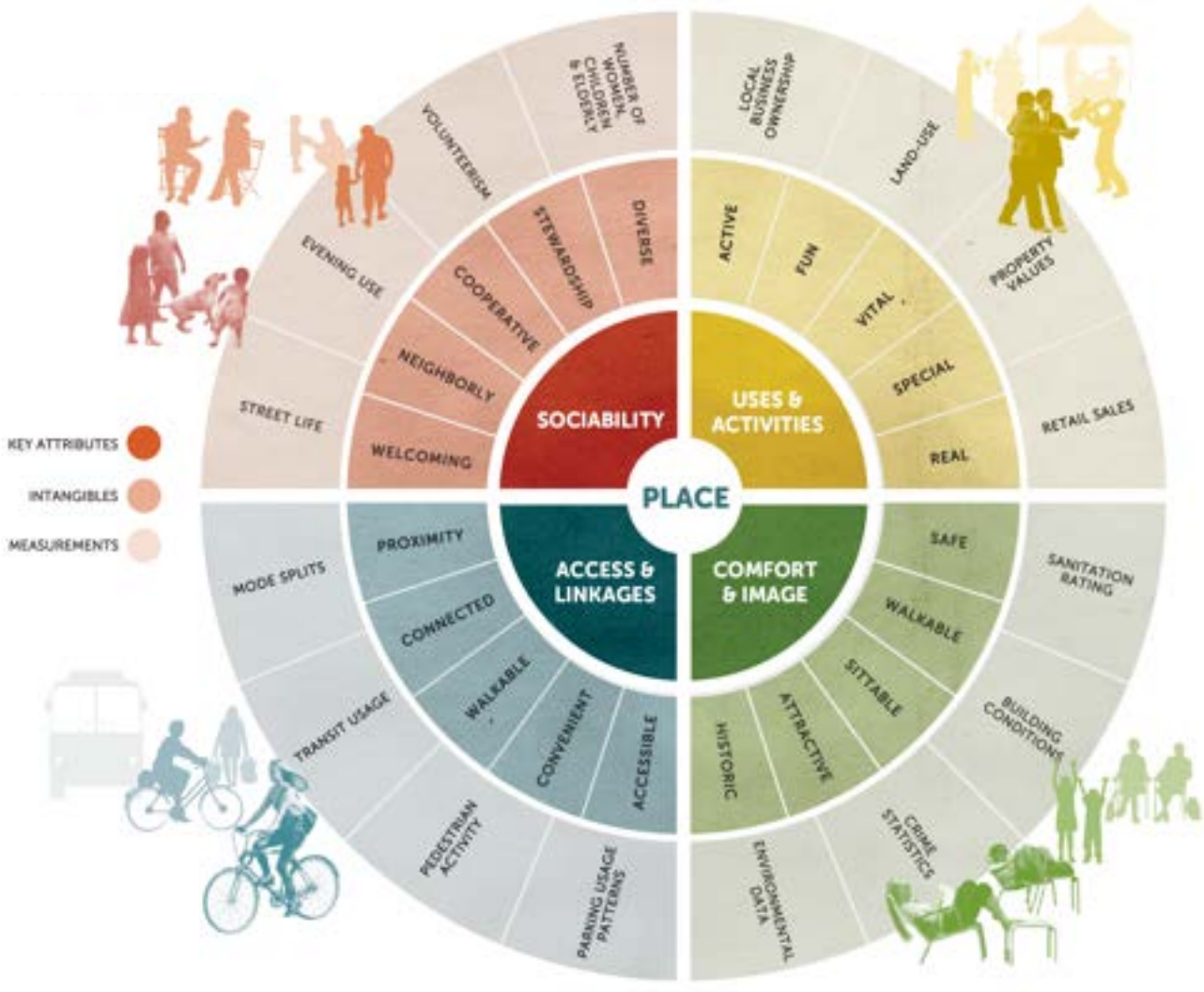


Fig. I.5 | Smart Map for a Smart Village © Project for Public Spaces, 2021.

The image illustrates the essential approaches to creating a *Smart Village* on a global scale. The diagram highlights four key macro-areas: sociability, users and activities, accessibility and connections, comfort and aesthetics, which are shared as guiding principles for the development of a smart village. This diagram serves as a tool to understand the interconnected dynamics required to foster an innovative, sustainable, and inclusive urban and rural environment.

I.1 Literature review on Smart Villages

The concept of *Smart Villages* is not a recent development; it has been discussed globally since 2007, with some impacts in Europe starting from 2017, thanks to the *EU Action Plan for Smart Villages*. This plan finally recognizes the importance of rural heritage, emphasizing its preservation and enhancement (Lattanzi et al., 2019).

Scientific literature on the keyword "*Smart Village*" between 2018 and 2022 (*Fig. 1*) shows a peak of approximately 1,374 scientific studies addressing this topic. During the same period, emerging and developing economies experienced a substantial increase in the creation of *Smart Villages*. Contrary to traditional expectations, this trend highlights a growing and deep connection between scientific research and innovation applied at the local level.

The trend of increased scientific output in developing countries, coinciding with the development of *smart villages*, demonstrates these countries' ability to embrace scientific innovation and apply it successfully in practical contexts. This phenomenon not only reveals the diversity of the global scientific landscape but also underscores the importance of considering both local and global factors in promoting sustainable development and *smart communities*.

Notably, significant contributions come from countries like India and Indonesia, followed by the United States (*Fig. 2*). This seemingly paradoxical phenomenon reveals a correlation between the development of *smart villages* and a particularly strong focus in economically disadvantaged countries, followed by more advanced contexts where implementing potential projects is comparatively easier.

The dominant themes within this scientific proliferation (*Fig. 3*) primarily focus on areas such as *Computer Science*, *Social Sciences*, *Engineering*, *Sustainable Environment*, and *Energy*. This highlights a strong synergy between academic research and the practical needs of local communities, particularly in developing contexts. The focus on computer science, digita-

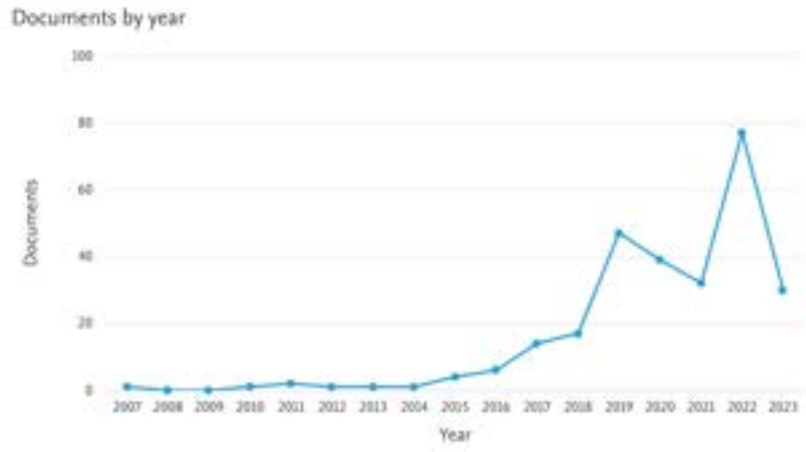


Fig. I.1.1 | Scientific literature documents on the topic of Smart Villages by year of publication, ©Scopus, 2023

lisation, and social sciences reflects the growing importance of technological solutions and social tools in the development of *smart villages*, where the first step is connecting to the rest of the world. The engineering sector plays a key role in this dynamic, as it provides the foundation for the advanced infrastructure needed to support the transformation of villages into *smart communities*. At the same time, growing environmental awareness has led to significant interest in sustainable environments and alternative energy sources, which are crucial for ensuring fair and sustainable development.

The analyses conducted were carried out using scientific platforms like Scopus, a reference in the academic world for research, along with the consultation of scientific articles and specialized literature. Based on a vast collection of data from authoritative sources, it provides a comprehensive overview of global scientific publications, ensuring the accessibility of information worldwide. The platform, acting as a beacon for researchers, students, and professionals eager to deepen their knowledge on a particular subject, allowed for the identification and highlighting of ongoing research and current design trends related to the topic.

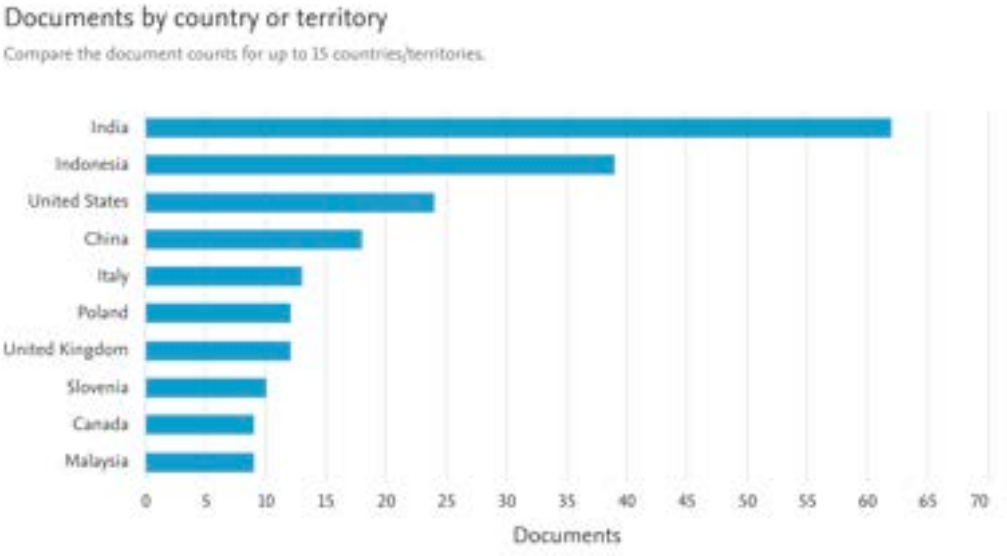


Fig. I.1.2 | Scientific literature documents on the topic of smart villages by geographic area, ©Scopus, 2023.

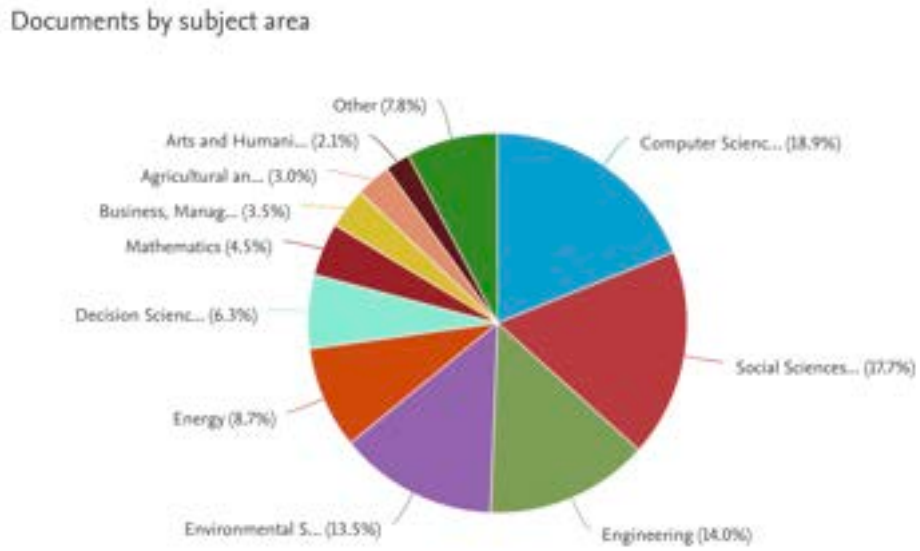


Fig. I.1.3 | Scientific literature documents on the topic of Smart Villages by thematic area, ©Scopus, 2023.

I.1.1 SMART Criteria: Defining and achieving goals with precision and success

The term "Smart" discussed so far is not accidental, and it is therefore important to specify precisely how the acronym it forms is interpreted in multiple exceptions that require a specific definition in order to understand how it influences the development of *Smart Villages* at extra-European, European, and Italian levels.

The SMART goal methodology, first coined in the work "*Attitude Is Everything: If You Want to Succeed Above and Beyond*" by Paul J. Meyer[1] *[...]*, an American entrepreneur and author, provides a precise and structured approach to goal setting, making them more manageable and success-oriented. When associated with the concept of a village, it already helps to understand the possible directions and orientations to pursue.

This acronym represents five key characteristics that every goal should have: *pecific, Measurable, Archievable, Relevant* and *Time-Based*.

Let's examine each of these components:

- **Specific**: Objectives of significant relevance and scope are well-defined and focused. The level of specificity has a considerable impact, as the clarity of the goal acts as an attracting force, concentrating energy towards achievement and drawing the necessary resources. In the context of *Smart Villages*, specificity enhances territorial resources;
- **Measurable**: A goal without a measurable outcome is comparable to a sports competition without a scoreboard: numbers are an essential element of the process. The inclusion of measurable parameters, such as earning a specific amount within a set period or acquiring a defined number of new skills within a month, provides a tangible reference to assess progress. Measuring the "*smartness*" of territories at both the initial and final stages ensures the feasibility of the process;
- **Achievable**: The tendency to set goals beyond one's capabilities is widespread, but to ensure achievability, it is crucial to maintain a realistic perspective. While ambitious, goals should be grounded in reality to avoid frustration. The encouragement to dream big is tempered by the need to keep one foot firmly grounded in reality. Compatibility and practicality are necessary for sustainable and feasible development;
- **Relevant**: The importance of a goal, in relation to others, is crucial for sustaining motivation over time. Strong reasons are essential to maintain long-term commitment. In the context of rural areas, the relevance is further emphasized by considering the specific weight of the goal to be achieved in relation to current results and territorial peculiarities;
- **Time-Based**: Any goal can only be effectively achieved when it is associated with a defined deadline, an essential motivational catalyst. Planning, always updated based on progress, is a crucial element for motivated and rational development.

The use of the term "Smart" when referring to rural areas and smaller towns, or villages, is essential as it emphasizes how the implementation of advanced technological solutions, aimed at optimizing efficiency, fostering innovation, and promoting sustainability, can contribute to cutting-edge contexts (Pagliari et al., 2018).

This terminology highlights how the adoption of modern practices can improve quality of life, connectivity, and stimulate local economic development, starting from a predefined framework that takes into account these five starting factors.

Sustainability will be the criterion for evaluating the functioning of a smaller center in producing and reproducing constant benefits over an indefinite period in various areas: financial, economic, institutional, socio-cultural, environmental, and technological. The integration of physical, digital, and human systems in the built environment offers a sustainable, prosperous, and supportive future for citizens through the optimal functioning of a village *service hub*.

[1] Meyer P. J. (2003), Attitude Is Everything: If You Want to Succeed Above and Beyond, Meyer Resource Group Publisher.

[...] *The term 'smart' has become so inflated as to be almost devoid of meaning. It's used to describe anything from an appliance to a two-year-old child. But what does it really mean to be smart?.*

Fig. I.1.1.1 | Smart criteria, ©Luisa Lombardo, 2024.

The steps to follow for implementation are as follows:

1. **study of the city and creation of its profile** through the establishment of a *city service hub*, understood as a model/prototype of a true *Smart City*.
2. **collection of essential field information** through interviews with citizens, merchants, and entrepreneurs, using forms designed to identify primary and secondary needs.
3. **creation of a *smart* program** with public-private partnerships (PPP Programme), supporting public institutions in managing the Smart Village.
4. **development of a system for the circular economy**;
5. **identification of challenges and opportunities** within the framework of an economic-social reorganization of the territory, where an action for redesigning the primary functions of services for and to citizens in a *city service hub* will be necessary. These will include strategic parts of the city acting as *service hubs* (parking, urban mobility, public transport, and commercial activities) for sharing and aggregation, supported by a "digital agora";
6. **transferring all possible information to the network** to develop projects that are closer to the citizen. It should be noted that the information gathered on the territory will generate a new list of needs that citizens will express during the interviews;
7. **creation of a strategic *action plan* and roadmap** to outline all the points to be developed based on the needs identified during the interviews and site visits;
8. **creation of a digital platform as a virtual agora** for public and private operators and citizens: an online agora, where it is easy to interface with the Public Administration and a system of public and private partners to propose start-up projects and modernization challenges for the offered services, integrated with demand.

Fig. I.1.1.2 | A Smart Village idea, ©Luisa Lombardo, 2024.

I.2 Non-European Smart Villages and case study cataloging

In the current context, where just over half of the global population has access to the internet while the other half remains disconnected, the global COVID-19[1] pandemic has highlighted the vital importance of digital networks and services for economic resilience and the continuity of essential public services such as education and healthcare. In this scenario, collaboration and multi-*stakeholder* partnerships are critical for reaching underserved and unconnected communities and for pursuing the goal of universal and meaningful connectivity. It is particularly in rural areas that this need is most apparent. With this perspective, the International Telecommunication Union (ITU) and its partners have promoted the creation of *smart villages* to foster sustainable development in remote and disadvantaged areas of the world.

The first *Smart Villages*, in fact, emerged outside Europe, particularly in developing countries such as Africa, India, Indonesia, and Nepal. These regions, where growth opportunities are limited and much work remains to be done, provide a starting point from which to build from the ground up. The term *Smart Village* emerged around 13 years ago with the idea of promoting the development of areas that, for us, might be considered small rural communities, but which for economically disadvantaged areas are collections of *Smart Villages* united by the lack of essential goods and services needed to ensure a dignified life for their inhabitants. In response to the desire to assist those who have less than we do, numerous non-profit organizations, associations, and even large multinational corporations have taken action to help these more vulnerable communities.

While the term *"smart"* is often associated with the digital world, observing the various projects undertaken worldwide, it becomes clear that it is also linked to the use and exploitation of natural resources to create new businesses and promote local products, facilitating entry into the large international market and fostering social and economic development practices. This primarily involves using digital tools to promote culture and innovation, provide education for women, ensure sustainable resource management, harness renewable energy sources, and, finally, promote a local identity that is often unknown. Therefore, the term *"smart"* is associated with the wise use of digital intelligence to activate virtuous processes of local development, which are based not only on significant financial investments but also on a huge and indispensable investment of human capital.

What truly makes these villages *smart* is the collaboration among the resident population, which provides the added value necessary to achieve sustainable and concrete parameters of livability and dignity. The unity among citizens represents the true success, further driven by the desire to surpass their own capabilities and potential, and most importantly, to achieve a sense of empowerment with the goal of attaining better and more satisfying long-term results, in order to be on par with developing countries that are significantly more advanced.

Exploring a series of *Smart Villages* identified worldwide, excluding those in Europe and Italy due to significantly different policies and *governance*, successful examples emerge particularly in the United States and Asia, but

[1] A study conducted by the European Union analyzed the impact of the coronavirus pandemic on economic and social disparities between urban and rural areas. The research, based on data collected in three different phases (spring 2020, summer 2020, spring 2021) and presented in TerritoriALL, a journal specializing in regional analysis curated by the Espon study program, revealed an increase in the gap between these two contexts, especially in some Central-Eastern European member states such as Hungary, Romania, and Bulgaria.

In particular, it emerged that one year after the start of the pandemic, the percentage of people experiencing economic difficulties in rural areas had increased by about 7% compared to urban areas, compared to a 5% difference recorded only one year earlier. This trend was observed in most member states, although with significant variations.

Financial difficulties in rural areas were highlighted as a concrete issue, with 70% of people in Bulgaria, Hungary, Lithuania, and Romania reporting difficulties in their household budget. In Croatia, Greece, and Slovakia, this percentage was even higher. In contrast, in cities, the percentage of those reporting financial difficulties was significantly lower.

The financial challenges reported by respondents included difficulties in paying bills, rent, and mortgages. The percentage of those unable to afford essential utilities such as electricity, water, gas, and telephone connection also increased. Furthermore, 8.10% of respondents in rural areas stated they could not afford rent or mortgage costs.

Researchers attribute these disparities mainly to the lower income and savings levels in rural areas compared to urban areas. As a result, the long-term impact of the pandemic on the gap between cities and rural areas will depend on the ability of rural communities to address the challenges posed by the crisis and ensure an adequate transition to a "new normal" that does not leave them behind.
Excerpt from ANSA, [last update: December 29, 2021]

also in other parts of the globe. The starting point is not population shortage, but rather the lack of services and sometimes widespread poverty. A *Smart Village* can also be highly populated; it is the lack of opportunities and the willingness for technological implementation that promotes shared territorial development.

In the United States, for example, *Smart Villages* have spread across various regions with the goal of revitalizing rural communities and promoting sustainable development. For instance, *Chattanooga* (*Fig. 1*) in Tennessee is famous as one of the first smart locations in the United States, thanks to the implementation of high-speed broadband networks and internet access in the surrounding rural areas, which fostered the growth of tech businesses and the creation of jobs in the information and communications sector. Fresno, California, adopted a smart farming approach by leveraging the Internet of Things (*IoT*) to monitor agricultural data and optimize irrigation, thereby reducing water consumption and increasing crop yields. *Jefferson*, Iowa, became an example of a *Smart Village* through the use of renewable energy sources such as wind and solar power, contributing to the reduction of carbon emissions and promoting energy sustainability (*Rural Broadband Access Loan and Loan Guarantee Program - RBALGP; Rural Development Broadband Initiative (RBDI), - Rural Utilities Service (RUS)*: an office for loans, grants, and other financial assistance to help rural communities provide public services, including electricity, water, natural gas, and broadband).

In Asia, for example, *Kerala* (*Fig. 2*) in India has implemented a *Smart Village* model aimed at improving access to healthcare and education through the use of digital technologies, thus enhancing the accessibility and quality of services through programs such as the *National Smart Village Construction Plan (2014-2020)* and the *National Smart City Construction Plan* (2014-2020).

Another significant initiative is represented by *Barefoot College*, an Indian project extended to several African countries, such as Kenya, Burkina Faso, Senegal (*Fig. 3 and 5*), and others. This organization has adopted a *Smart Village* model focused on the training and education of women in rural communities, known as "*solar mamas*" to build and maintain solar panels, thereby providing clean and sustainable energy to their communities.

In Japan, *Smart Villages* are often linked to the concept of "Society 5.0," which aims to combine advanced technologies with human well-being. Japanese rural communities are adopting innovative solutions to address the aging population, such as the use of robots for elderly care and the implementation of smart systems for monitoring health conditions, thanks to the 2019 *Smart Rural Community Development Program*.

In Africa, *Smart Villages* represent an important initiative to tackle the challenges faced by rural communities on the continent and promote sustainable development at the local level. Among the examples of *Smart Villages* in Africa is the *Re:learn Hub of CcHub* (Co-Creation Hub) based in Lagos, Nigeria. This project focuses on the use of information and communication technologies (ICT) to improve education in rural communities, providing spaces and resources for digital learning and teacher training, with the goal of reducing the digital divide that often characterizes these areas.

In South Africa, there is the Digital Villages initiative (*Fig. 4*), which aims to bring digital technologies to the country's rural communities, thus improving access to essential services such as education, healthcare, and legal advice. This initiative works towards the construction of community centers equipped with internet access, computers, and other digital resources (*African Union Smart Villages Program 2018* and *International Monetary Fund Smart Villages Program 2020*).

Additionally, it is important to mention the *Smart Africa* initiative, which represents an ambitious pan-African effort aimed at promoting the development of information and communication technologies (ICT) across the continent. This initiative focuses on improving access to ICT, encouraging innovation, and promoting socio-economic development, including the

Fig. I.2.1 | Chattanooga, Tennessee ©Tripadvisor, 2023.

Fig. I.2.2 | Kerala, India ©Saga Magazine, 2023.

Fig. I.2.3 | Barefoot College, Africa ©The New York Time, 2011.

implementation of similar projects in various African countries.
The initiatives mentioned above represent just a few examples of how digital and innovative technologies are helping to transform rural communities in non-European territories and address the challenges of rurality with sustainable and innovative solutions.

The success of *Smart Villages* outside Europe has been achieved partially and is still under development, thanks to several factors, including the strong synergy between public and private actors (the main economic supporters of such initiatives), investments in digital infrastructure, the active involvement of local communities, and great collaboration with multinational companies, universities, and research institutions. The strong participation of communities ensures long-term sustainability and the well-being of those involved, demonstrating that non-European *Smart Villages* can inspire Europe to pursue innovative strategies for the future of rural areas, promoting sustainability, innovation, and economic prosperity beyond "*top-down*" funding.

In the following pages of this section, an in-depth analysis of non-European *Smart Villages* will be conducted. The focus will be on various regions of the world, particularly examples from the Americas, Asia, and Africa, as outlined above, but not limited to them.

This will highlight how *Smart Villages* represent an innovative approach to addressing the complex socio-economic and environmental challenges that rural communities face in different parts of the world. Through the strategic adoption of digital technologies and the implementation of sustainable approaches, these projects aim to improve the quality of life, stimulate economic development, and carefully preserve the cultural identity of the rural areas involved.

Examples of *Smart Villages* will be explored where various initiatives have been launched to revitalize rural communities and capitalize on the opportunities offered by the use of digital and sustainable technologies. Through a thorough analysis, the goal is to provide a comprehensive overview of the many ongoing initiatives worldwide and to draw *insights* and inspiration for successfully addressing the global challenges faced by rural communities, pursuing a sustainable, inclusive, and respectful future for cultural and environmental identities, as should be pursued equally in Europe and around the world.

Fig. I.2.4 | Samsung Digital Village, Sud Africa ©ITWeb Africa, 2015.

Fig. I.2.5 | Barefoot College © Varialstudio, 2019.

I.3 European Smart Villages and case study cataloging

European *Smart Villages*, like those outside Europe, represent an innovative approach aimed at revitalizing rural areas through the implementation of digital technologies and sustainable solutions, as already mentioned for the extra-European context. By leveraging digitalisation and sustainable practices, European *Smart Villages* promote social, economic, and environmental development, paving the way for vibrant and resilient rural communities in Europe. They embrace digital technologies, sustainable practices, and community engagement to improve quality of life and foster economic growth. Key elements include the priority of digital connectivity, sustainable energy solutions, innovative services, entrepreneurship, job creation, as well as social and community involvement in depopulated areas, the improvement of quality of life through enhanced services, promotion of environmental sustainability, and empowerment of rural communities. They primarily contribute to combating depopulation, attracting and retaining residents through job opportunities and an environment conducive to well-being. However, inner European countries face several challenges, including limited resources, regulatory barriers, resistance to change, and the need to ensure inclusion and digital literacy in rural areas. Additionally, there are significantly fewer grants from private sources, compared to public ones.

At the political level, the European Union (Recommendation of the European Commission, 2016) provides strong support through several instruments such as the Cohesion Policy[1], the European Broadband Strategy[2], the Digital Agenda for Europe[3], the Common Agricultural Policy[4] and the Horizon Europe Program[5]. Furthermore, the European *Smart Villages* Initiative has been established to coordinate and promote the implementation of policies supporting *smart villages* across Europe, facilitating the exchange of knowledge and *best practices* between regions.
European policies supporting *Smart Villages* are a key pillar for the revitalization of rural areas through innovation and digitalisation (European Commission, 2016). Through funding, guidelines, and strategic initiatives, the EU promotes digital connectivity, sustainability, and social inclusion in *Smart Villages*. Unlike extra-European examples, the European Union is significantly focused on promoting *smart villages*, prioritizing available public funds over privatized initiatives (European Commission, 2010). These important policies provide opportunities for economic development, job creation, environmental preservation, and improved quality of life in rural European areas. The EU's ongoing commitment to supporting *Smart Villages* plays a substantial role in creating resilient, innovative, and future-oriented rural communities within the European landscape.

The European Network for Rural Development (ENRD)[6], for example, represents a collaboration platform that brings together *stakeholders* from across Europe to promote innovation and sustainability in rural areas. Founded with the aim of facilitating the sharing of knowledge, experiences, and *best practices*, it plays a crucial role in supporting the planning and implementation of EU rural development policies. *Smart Villages* in Europe represent an increasingly widespread and diverse reality, present in various countries across the continent. Some of the best examples in Europe include

[1] The implementation of the 2021-2027 regional policy is carried out through the following funds: ERDF, ESF+, Cohesion Fund (Italy is not a beneficiary), and the Just Transition Fund (JTF), in addition to the European Maritime, Fisheries and Aquaculture Fund (FEAMPA).

[2] The European Digital Agenda set a connectivity target of 30Mbps for all Union citizens by 2020; the minimum bandwidth to define the Ultra-Broadband (UBB) service. Europe then set a target of 100Mbps for 50% of the population. Italy opted for 100Mbps for 85% of the population.

[3] Launched in 2010 for a 10-year period, it established for the first time the key role of ICT in achieving European objectives. In 2015, it further developed the digital agenda around three pillars: improving access for consumers and businesses to digital goods and services across Europe, creating a favorable environment for the development of digital networks and services, and maximizing the growth potential of the digital economy.

[4] The Common Agricultural Policy (PAC) represents the set of rules recognized by the European Union, which gives centrality to the agricultural sector in order to promote fair and stable development within the member countries. It aims to achieve the following objectives: increase agricultural productivity; ensure a fair standard of living for the rural population; stabilize agricultural markets; ensure food supply security; and guarantee reasonable prices for consumers.

[5] The European Union's Framework Programme for Research and Innovation for the period 2021-2027. The goal is to strengthen the EU's scientific and technological base, including developing solutions to address strategic priorities such as the *green* and digital transitions. It also contributes to achieving sustainable development goals. It is the EU's flagship initiative supporting R&I, from conception to market.

[6] It serves as an informational platform on the practical functioning of rural development policies, programs, projects, and other initiatives, and on how to improve them to achieve better results. The goal is to reach and engage anyone who shows interest to rural development.

(Rossi F. et al., 2017):

In Italy, *Damanhur* in Vidracco, Piedmont, is an intentional community located in the northwest of Italy. It is known for creating an underground system of temples and artistic galleries, as well as for adopting ecological and sustainable practices. Damanhur has also developed a cooperative organization for resource management and democratic participation of its residents.

Marmilla Smart Community (*Fig. 1*), in the Marmilla geographical subregion in Sardinia, is a project focused on using digital technologies to improve local services, promote sustainable tourism, and support the circular economy, thus contributing to the well-being of the local community.

Borgo Soandri, in the Marche region, is an ancient rural village that has been redeveloped as a *Smart Village*, with particular attention to environmental sustainability and efficient resource use through the implementation of a diffused hotel aimed at encouraging eco-sustainable tourism.

Elsewhere in Europe, **in Portugal**: *Aldeias Do Xisto*, located in central Portugal, is a project that transformed 27 abandoned villages into sustainable tourist destinations. Through the revitalization of historic buildings, the use of renewable energy, and offering authentic cultural experiences, the project has contributed to revitalizing rural communities and promoting sustainable tourism.

Tamera (*Fig. 2*), a sustainable village located in Alentejo, was designed as a model of a sustainable community based on energy self-sufficiency, organic farming, and water resource management. Tamera is also committed to research and education on topics such as peace, ecological healing, and cooperation among people.

Aldeia Solar is known for its use of renewable energy sources and sustainable practices to reduce environmental impact and promote sustainability.

In Spain:

Lavafante (*Fig. 3*), in the Asturias region, has adopted innovative technologies for the sustainable management of water resources. Through the use of sensors and smart irrigation systems, Lavafante has reduced water consumption in agriculture and implemented sustainable farming practices to preserve the natural environment.

Mata De Alcántara focuses on energy self-sufficiency, smart mobility, and the digitization of public services, aiming to improve the quality of life for residents in this rural area.

Urdaibai, in the Basque Country, is a biosphere reserve that has implemented sustainable solutions for resource management and the promotion of responsible tourism.

In Denmark:

Samsø: an island known as one of the first *Smart Villages* in the world to be powered by renewable energy, achieving energy self-sufficiency through the use of wind and solar power, as well as promoting energy efficiency practices. It has now become a popular tourist destination and has created jobs in the renewable energy sector.

In Austria:

Schlierbach (*Fig. 4*): a village that has successfully implemented smart solutions for energy and water efficiency. Through the use of advanced technologies such as energy monitoring and building management systems, it has reduced energy consumption and promoted the sustainable use of water resources.

In the Netherlands:

Schoonschip, is a sustainable floating village where homes are equipped with innovative technologies for energy efficiency and the sustainable use of water resources.

In Germany:

Schwerin, in the Mecklenburg-Vorpommern region, has adopted smart technologies for building energy efficiency, waste management, and sustainable mobility.

Freiburg Vauban (*Fig. 5*) is a model for sustainable urban development

Fig. I.3.1 | Marmilla, Sardegna, Italia ©La nuova Sardegna, 2023.

Fig. I.3.2 | Tamera, Portogallo ©Italia che cambia, 2020.

Fig. I.3.3 | Lavafante, Spagna ©Corriere della sera, 2022.

that highlights ecological technologies, energy efficiency, and sustainable mobility, with a focus on environmental impact

In the United Kingdom:

Winterton-On-Sea, near Norfolk, is a community that has adopted renewable energy, such as solar and wind power, to power its buildings and reduce environmental impact.

In France:

La Ferme Du Bec Hellouin, in Normandy, is an organic farm that uses sustainable and intentional farming techniques to grow food ecologically.

In Sweden:

Hjulsjö, Närke, has experimented with the use of smart technologies to optimize energy use and reduce waste.

Österbymo Smart Village (*Fig. 6*) is a digitally connected community offering high-speed internet access, smart grid solutions, and innovative services, aimed at improving the lives of its residents.

In Finland:

Oulu Innovation Village, in Oulu, is a technological and entrepreneurial innovation area that promotes collaboration and the development of smart solutions;

Lyseparken, is a neighborhood in Stavanger that integrates smart solutions for public lighting, waste management, and sustainable mobility;

Brütten, in Zurich, is a Swiss municipality that has adopted ecological technologies for energy supply, such as solar power and cogeneration (*Fig. 7*).

In Switzerland:

Tänikon Smart Village, uses smart farming techniques, renewable energy systems, and electric mobility solutions to create a sustainable rural community at the forefront of innovation.

In Estonia:

Lõunakeskuse Smart Village, in Tartu, focuses on using digital and sustainable solutions to improve daily life in the community and make the village a modern and well-organized place.

In Norway:

Gjesdal Smart Village uses digital technologies to improve waste management, mobility, and actively engage citizens in village life.

In North Macedonia:

Belasica Smart Village has the main objective of using digital technologies to promote sustainable tourism and economic development in the region (D'Orazio et al., 2015).

Fig. I.3.4 | Schlierbach, Austria ©Mapcarta, 2023.

Fig. I.3.5 | Freiburg Vauban, Germania ©Visit Freiburg, 2023.

Fig. I.3.6 | Österbymo Smart Village, Svezia ©Fishing Cabin Rental, 2023.

Fig. I.3.7 | Tänikon Smart Village, Svizzera ©Agroscope, 2023.

These are just a few of the *Smart Villages* in Europe that have demonstrated success in applying digital technologies and sustainable solutions for rural community development, thanks to funding from Europe (Ratti C. et al., 2016). It is important to note that these examples represent only a small selection of the numerous, ever-evolving initiatives that are radically transforming rural areas in Europe. Each *Smart Village* is unique and responds to the specific needs and challenges of its community and territory, contributing to the creation of a more sustainable and prosperous future for the rural areas of the continent.

Within the broader context of *Smart Villages*, there are numerous European projects that have addressed this topic. However, the most important are *Smart Rural 21*, *Smart Rural 27*, and the pilot project "*Eco-Social Smart Villages*". In particular, the *Smart Rural 21* and *Smart Rural 27* projects represent two initiatives funded by the European Commission with the common goal of promoting the development of *smart villages* in Europe through selected pilot cases. Below is a formal description of both projects:

Smart Rural 21[7], a project lasting two and a half years (2018-2020), it involved 21 pilot villages in 12 EU member states. Its mission was to develop and implement strategies aimed at transitioning these villages into *smart communities*. The specific objectives included social innovation, collaborative *governance*, local economic development, and environmental sustaina-

bility-

Smart Rural 27[8], a three-year project extended from 2020 to 2023, it involved 27 EU member states. The main objective was to assist member states in defining frameworks for creating infrastructure supports for *smart villages*. The key focus areas included policies and strategies for rural development, capacities and skills, funding, and investments.

Both projects highlighted that being a *smart village* involves the use of digital technologies and innovation to address local challenges, improving the quality of life for residents. These villages rely on innovative and sustainable approaches, incorporating technological solutions to optimize services, infrastructure, and resources, with the aim of creating more resilient and future-oriented communities.

At the same time, it is worth mentioning the pilot project *Smart eco-social villages*[9], summarized in the executive report drafted by the *Directorate-General for Agriculture and Rural Development of the European Commission*, which identifies *best practices* to support the future development of strategies. The project is structured around four main themes, analyzing opportunities and challenges in the rural areas of the European Union, defining *Smart Villages*, illustrating examples of *best practices*, and exploring the development of a strategy for a smart village. The document emphasizes that *Smart Villages* are rural communities that use innovative solutions to improve their resilience, leveraging digital technologies and promoting active participation from the local community, as well as the importance of effective *governance*, active community involvement, simplicity in strategies, and cooperation with other rural and urban communities and actors. Furthermore, it stresses the need to simplify and streamline procedures for accessing public funding, support small-scale investments, and promote cooperation between communities. The project underscores the importance of providing support at the European, national, and regional levels for the development of *Smart Villages*, with particular attention to less favored rural areas. The three key lessons provided are the wide variety of initiatives in rural EU areas, the importance of citizen participation, and the need for a flexible and targeted support framework across different levels of government. It thus offers a detailed overview, providing the first important guidelines for supporting and developing such initiatives in rural areas of the European Union. By analyzing the challenges and opportunities faced by rural areas in the EU, the pilot project highlights the need for simplified public funding policies and support at different levels of government to foster the development of *Smart Villages* in the European Union (Rossi et al., 2017).

A roadmap that can be adapted to the specific needs of the study area. The implementation could constitute a significant step towards a coherent and integrated policy capable of addressing territorial challenges more effectively. An appendix will focus on additional case studies of *Smart Villages* in different European countries (Caragliu et al., 2019).

Each case study, as was done for the analysis of non-European contexts, will provide a broad overview of the characteristics and objectives of each project, highlighting the results achieved and the innovative solutions adopted. These examples represent just a selection of the many initiatives contributing to the transformation of rural areas in Europe, but they will provide a comprehensive framework of the potential and benefits of implementing such practices in the European context. A thorough understanding of these case studies is crucial to fully grasp their positive impact across Europe.

Each project tells a unique story of resilience, innovation, and community involvement, demonstrating how digitalisation and sustainability can contribute to a more prosperous future for these European rural areas. Through these examples, the hope is to inspire other communities to undertake similar initiatives and provide valuable *insights* for technological and social progress. The analysis presents new opportunities and challenges for European rural areas, where the implementation of smart and innovative solutions appears to be a shared hope.

[7] Smart Rural 21. (2021). Smart Rural 21 project: Supporting rural communities in becoming smarter. Retrieved December 16, 2024, from https://www.smartrural21.eu/

[8] Smart Rural 27. (2023). Smart Rural 27 project: Supporting rural areas in becoming smarter. Retrieved December 16, 2024, from https://www.smartrural27.eu/

[9] European Commission. (2019). Smart eco-social villages pilot project. Retrieved December 16, 2024, from https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cmef/rural-areas/smart-eco-social-villages-pilot-project_en

Fig. I.3.8 | Differences Between Extra-European Smart Villages and European Smart Villages; ©Luisa Lombardo, 2024.

The table presents a comparative analysis between extra-European and European *Smart Villages*, focusing on the technologies used, available funds, challenges, regulatory barriers, and institutional support. On one hand, extra-European experiences tend to use more advanced technological solutions, often in contexts with fewer regulatory constraints, but face challenges related to access to funding and a lack of structured institutional support. On the other hand, European *Smart Villages* benefit from a consolidated regulatory framework and strong institutional support, but face stricter regulatory barriers and a greater focus on environmental sustainability and social inclusivity. The table highlights how the different policies and resources available influence the adoption of technologies and the development of projects in both contexts, providing *insights* for adapting and integrating *best practices*.

Fig. I.3.9 | Freiburg Vauban, Germania ©Visit Freiburg, 2023.

Fig. I.3.10 | Baia dei Gelsomini © SR27, 2023.

Fig. I.3.11 | Ostana, Italia, SR21 © Silvia Pasquetto, 2017.

Fig. I.3.12 | Gaiba © SR27, 2023.

I.3.1 Methodological strategies for case study mapping

Good practices for the regeneration and enhancement of small towns represent a manifestation of the metamorphosis affecting inner areas, offering virtuous experiences that act upon and transform spaces, communities, and the relationships between them. These elements are an essential aspect of the research, considering good practices as devices that, from *Michel Foucault*'s perspective, represent a formation with a dominant strategic function at a given historical moment. This involves a rational and concerted study of the strengths, aimed at developing them in a specific direction, blocking them, or stabilizing them.

With the awareness of the urgency of addressing the physical, social, and economic marginality of an extensive part of the national territory, this paragraph presents the methodology used for analyzing and selecting the case studies. Recognizing the significant potential of these areas for the revival of localities, it proposes a reflection on the possibility that the mapped and analyzed experiences may act as devices to reinterpret the territories in a sustainable key, considering them as laboratories for the future.

The results of this proposal constitute a useful component for drafting the final guidelines for the revival of inner territories. After constructing the analytical method, each experience was examined based on the methodology adopted, distinguishing between interventions stemming from public policies and those promoted by private initiatives, its innovative nature, its ability to generate economies and promote the reactivation of places, and the scale of application, distinguishing between urban-scale and territorial-scale cases.

The development of data sheets was essential for creating a knowledge framework of good practices for the rehabilitation and enhancement of small towns. The analytical section, resulting from the qualitative analysis, provides a further understanding of the specifics of each case, helping to extract valid references for defining potential future approaches to the regeneration and enhancement of small towns. The cataloging of the data sheets, in detail, involved investigating the experiences through research in various sources (bibliographical and online), which were subsequently mapped. For each case studied, in-depth sheets were developed. The goal was to create a hypothesis of a guidebook of good practices, which, while not exhaustive, represents an initial proposal of innovative solutions implementable over time. This proposal aims to highlight virtuous practices for the rehabilitation and enhancement of small towns, paying particular attention to the realities operating in territorial systems.

For the cataloging and mapping process, a preliminary verification of the requirements for each practice was conducted. This verification involved analyzing numerous other case studies, even those not directly related to the territory in question or representing dynamics too distant. The first level of verification was defined by the "eligibility criteria," composed of three components, which must be satisfied by the practices examined. A second level, defined by the "qualification criteria," includes four categories of intervention, and the experience must meet at least one of them.

After verifying the first and second-level requirements, approximately one hundred practices from all over the world were examined. These experiences were selected using a qualitative approach, considering the highest degree of correspondence to the four types of actions identified as qualification criteria. The goal is to build a framework of good practices across the entire national territory for the Italian case, but also to map further significant experiences, even those not directly found within Italy, in order to benefit from reproducible experiences

In detail:

A. Eligibility Criteria (First-Level Requirements)

- **A.1 Definition of SMART Village** - The municipality involved must have implemented smart policies that fully integrate it into the concept of a smart village. This recognition stems from the municipality's abi-

lity to develop and implement innovative solutions that contribute to the promotion and enhancement of the territory within a framework of sustainability and innovation. Such identification is the result of the municipality's capacity to develop and promote initiatives that stand out for their innovation, enhancing the area's visibility through effective media dissemination and local press coverage.

- **A.2 Demographic Size** - The municipality can be a small town or a peripheral area of a large urban center or city. Alternatively, it may include small territorial areas, such as outskirts or neighborhoods, characterized by a limited size and local specificities that justify their inclusion in the smart strategy. The municipality is preferred if its population does not exceed 10,000 inhabitants, with the reference of 5,000 inhabitants being the benchmark for defining a "small municipality"[1] according to the bill approved by the Chamber of Deputies on April 18, 2007. This definition extends up to 10,000 inhabitants, considered the minimum demographic threshold for establishing unions of municipalities, particularly in the national context and in Southern regions, where centers with up to 10,000 inhabitants are considered fragile areas (Polci, 2015).
- **A.3 Geographic Size** - It is preferable that the municipality falls within the classification of an inner area, as defined in the "National Strategy Document for Inner Areas: Definitions, Objectives, Tools, and *Governance*, Agreement 2014-2020" (DPS, 2014). The municipality can be located along the coast, on a hill, or in the mountains, but it must present disadvantages in terms of services or opportunities linked to the application of smart strategies. These limitations may include infrastructure, economic, or management deficiencies that require targeted interventions to promote sustainable and integrated development, thus positioning the municipality as intermediate, peripheral, or ultra-peripheral.

B. Qualification Criteria (Second-Level Requirements)
After the cataloging and mapping of the cases, a selection was made from those considered to be the most representative. These were subjected to further in-depth analysis and a second-level cataloging to define the impacts and values generated, with the aim of creating replicable models in different contexts. For the selection of these exemplary cases, good practices for each type of project action were chosen to build a reference framework of virtuous cases, amounting to eight practices. Compliance with at least one of the following intervention categories constitutes the second-level requirement for qualification:

- **B.1 Actions with tourist, real estate, and hospitality purposes;**
- **B.2 Actions with productive and/or commercial purposes;**
- **B.3 Actions with artistic, cultural, and educational purposes;**
- **B.4 Actions with social and cooperative purposes;**
- **B.5 Actions involving technology and digitalisation;**
- **B.6 Actions for the rehabilitation and enhancement of tangible and intangible heritage;**
- **B.7 Actions for effective governance;**
- **B.8 Actions for improving accessibility.**

Additionally, the final analysis phase concerns the study of international cases carried out during the activities as a *Visiting Researcher Student* at the Real Academia de Belles Artes de San Carlos de Valencia and the Universitat Politecnica de Valencia. This phase followed the same approach used for the Italian cases, utilizing the previously described data sheets (adapted as necessary), but analyzing a smaller number of practices (one experience per category).

All the case studies identified following the outlined methodology are documented and detailed within the *"Case Study Booklet"* available in the attached document to the thesis, Appendix 1. This collection provides a comprehensive overview of the examined experiences, offering an in-depth

[1]The term "Small Municipality," as defined in the current administrative context and based on the LN approved by the Chamber of Deputies on April 18, 2007, refers to a municipality with a population of 5,000 inhabitants or fewer, classifying it as "small." This definition applies to 72% of Italian municipalities. The relevant legislation, outlined in the law of April 7, 2014, Articles 5 and 6, addresses metropolitan cities, provinces, and the unions and mergers of municipalities. In particular, Article 1, paragraph 107 sets the demographic threshold for the establishment of unions and agreements as 10,000 inhabitants.

The demographic classification, in accordance with the provisions of the Consolidated Law on Local Government, approved by Legislative Decree in August 2000 (no. 267), outlines the resident demographic categories. In the "settlement distress" report on Italy, fragile realities are described as a phenomenon affecting marginal or marginalized territories of small dimensions. This situation extends to larger territories, causing various challenges, particularly related to the resident population. Not only are small municipalities at risk of settlement distress, but more than half of Italian municipalities have a population of fewer than 10,000 inhabitants.

view of the strategies, practices, and impacts associated with each case study. Access to the "*Case Study Booklet*" allows readers, scholars, and interested parties to systematically examine the various initiatives considered, providing documented and thorough support for understanding the results and conclusions within the context of the thesis. Consulting Appendix 1 is, therefore, an indispensable resource for further exploring and contextualizing the arguments and analyses presented during the research.

Fig. I.3.1.1 | Methodological diagram of the selection of case studies related to Smart Villages © Luisa Lombardo, 2023.

I.4 Italy towards the development of Smart Villages

In an increasingly homogeneous and globalized world, the forgotten towns, especially those in the Italian hinterland, often labeled as "villages," represent a precious and authentic part of our cultural and social heritage. However, the time has come to abandon the reductive label of "village" and embrace the more inclusive and meaningful term "town." Italian towns are much more than simple urban agglomerations; they are the beating heart of our regional and national identity. These places, which can be densely populated or suspended in an apparent calm, under the sun or shrouded in fog, reveal a variety of stories, traditions, and lifestyles that reflect the richness of our nation. They are communities of people who know each other, help one another, and build the social fabric that forms the foundation of our society (Agenzia per la Coesione Territoriale, 2021).

While the "village" concerns the urban dimension and defines more the container than the content, focusing on the physical and architectural structure, the term "town," on the other hand, refers to the community, to the network of relationships and functions that include people, their activities, and their feelings of belonging and neighborliness[1]. Proximity is an essential value, the foundation of social cohesion, a space in which to manage conflicts and build mutual recognition that influences the sphere of dignity and responsibility. In the town, individuals are never alone and are always intertwined with the community dimension. Individual behaviors become collective practices, and personal interest aligns with collective interest. This dynamic balance is what makes towns so unique and vital. The word "town" goes beyond a simple geographic description and represents, in fact, a deeper concept, based on community, human relationships, and mutual responsibility. Proximity, both geographic and social, is a fundamental value that contributes to social cohesion by creating a unique social fabric (Barbera et al., 2022).

Unfortunately, the rhetoric of "small is beautiful" often reduces itself to superficial idealization. Towns are not just picturesque places for a romantic escape, summer holidays, or respite from the chaos of the cities. On the contrary, they are spaces of work, innovation, and great resilience. In rural communities, agriculture, livestock farming, and craftsmanship play crucial roles in the local economy and culture, often the result of traditions passed down through generations. Short supply chains, the collective management of common goods, and cooperative micro-enterprises represent sustainable economic models that can help keep these areas alive. However, to do justice to these communities, we must abandon the uniform approach to policy and services. The diversity of Italy's regions requires differentiated policies that take into account local peculiarities and territorial vocation.

It is not possible for towns to be transformed into leisure spots for weekends or just tourist destinations; the typical "quick getaway" spots. Their authenticity and vitality depend on a constant commitment to preserving and promoting what makes them special. We need to rediscover and enhance the unique resources of Italy's inner areas, embracing a new way of living, producing, and consuming that goes beyond "small-townism."[2] The way forward to save towns is clear: invest in agriculture, livestock farming,

[1] The book "Contro i borghi", edited by Filippo Barbera, Antonio De Rossi, and Domenico Cersosimo and published by Donzelli, through a series of concise essays, aims to dismantle the romanticized and idealized image of Italian villages, highlighting the importance of rural communities and inner areas within territorial policies. The authors emphasize the need to redefine the concept of "village," focusing on the everyday needs and lives of local communities rather than solely on tourist attraction. The misuse of the term "village" in common imagination is criticized, as it risks stripping rural realities of their meaning, relegating them to mere postcard landscapes. Furthermore, the implications of public policies are discussed, underlining the necessity for a political vision aimed at the social and economic regeneration of inner areas. The importance of investing in essential infrastructure and services to ensure a dignified life in villages is reiterated, rather than focusing exclusively on tourism. Finally, the concept of "slow movement" is proposed as an approach to understanding the relationships between villages and their surrounding context, suggesting a return to traditional territorial relations and the enhancement of local resources.
Excerpt from "Contro i borghi, per i paesi" Altreconomia, by Luca Martinelli — July 13, 2022.

[2] The article by Letizia Bindi, published on March 1, 2021, explores the dynamics of marginalization, depopulation, and regeneration of rural and mountainous areas in Italy, with a focus on heritage communities and their cultural practices. Drawing inspiration from the work of Ernesto de Martino and the Lucanian folk song "Canzone della Rabata," the author reflects on the historical role of farmers as political subjects, emphasizing how the fragmentation of the left contributed to the abandonment of inner areas and their folklorization from the 1960s onwards. The process of marginalization has been intertwined with national and European policies that, while promoting industrialized and intensive agriculture, have often overlooked local specificities. However, since the 1990s, a paradigm shift has led to the enhancement of sustainable, organic, and territorial agricultural practices, encouraging repopulation and the revival of rural communities. This movement, however, is influenced by global economic crises, climate change, and the impact of neoliberal economies.

The author highlights the need for a multidisciplinary perspective to understand depopulation phenomena and the regeneration experiences of marginal areas, including ethnographic studies, analysis of mobility, and a critical reflection on the relationships between nature and culture in the Anthropocene. In particular, the importance of redefining representations of mountain and rural communities is emphasized, highlighting their resilience and welcoming capacity.
Source: Bindi, L. (2021). *Beyond 'small-townism'. Heritage communities and regeneration of fragile areas.*

[3] Italian villages represent a significant portion of the country's administrative landscape, with a total of 5,521 municipalities, accounting for 69.85% of the 7,904 total municipalities. These villages are home to approximately 10 million residents, equivalent to 17% of the national population, and cover 54% of Italy's territory. Predominantly located in the inner areas of the peninsula, they are distributed along the Apennines and the Alpine arc. Piemonte and Lombardia contain nearly 50% of the total, with 2,089 villages out of 5,521. Regions such as Abruzzo, Calabria, Molise, Sardinia, Valle d'Aosta, and Trentino-Alto Adige see small municipalities occupying between 80% and 90% of their territory, while in Puglia, Tuscany, and Emilia-Romagna, they represent less than 50% of the regional total.

Over the years, the inner areas have experienced gradual depopulation, losing 900,000 residents since the post-World War II period. This decline has particularly affected small municipalities along the Apennines and the Alpine arc. The mountain population, which in 1951 accounted for 41.8% of the total, now stands at approximately 26%. Between 1981 and 2020, the population of small municipalities experienced an average annual change of -0.2%, decreasing from 10,758,231 to 9,961,955 residents.

This demographic decline has led to an aging population, with 17.6% of residents aged over 65. Furthermore, 16.6% are between the ages of 40 and 65, while only 15.7% are under 40. These figures raise significant concerns regarding the identification and retention of the younger population segment. Culturally, villages constitute an essential part of the national heritage, encompassing 31.1% of cultural sites and assets and 32.8% of Italian museums. They also make a substantial contribution to Italy's food and wine culture and local product production, with 90% of PDO (Protected Designation of Origin) and PGI (Protected Geographical Indication) products originating from small municipalities.

However, not all villages are alike, and many small municipalities, especially those with fewer than 5,000 residents, face infrastructural and cultural challenges. These include inadequate infrastructure, limited education and cultural awareness among the local population, and difficulties in accessing innovations such as broadband connectivity. To address these challenges and implement targeted interventions, it is crucial to analyze demographic data on villages in relation to and craftsmanship, promote solidarity and cooperation, and adopt policies tailored to the specific needs of local communities, as well as focus on the most authentic architectural heritage, which is often better preserved but far from contemporary living standards. Only through this differentiated and inclusive approach can we protect and enhance towns, preserving their authenticity and vitality, and contribute to building a more sustainable and inclusive future for all (Presidenza del Consiglio dei Ministri, 2020).

The challenges faced by small communities in Italy are evident when considering the limitations imposed by their small size, a significant obstacle compared to the large-scale needs required by the modern economy. This situation often puts rural areas at a disadvantage in favor of larger, more organized centers that can provide higher-quality services. A disparity particularly evident in inner areas, especially along the Apennine belt, which, unlike the Alpine passes connecting to the northern states, have undergone less infrastructure development and, consequently, have been subject to progressive abandonment.

I. 4.1 Minor Italian villages

There are just over 300 villages, with a total population of approximately 6,000 inhabitants, certified by the Superintendent of Fine Arts as architectural and natural heritage sites. According to 2020 data presented by Coldiretti, 16% of Italians—around 9.8 million people—reside in these charming towns, which make up 54% of the national territory, reaching as much as 70% in some regions[3].

In addition to those already internationally renowned, many other Italian villages have recently embarked on redevelopment and revitalization programs, not solely for tourism purposes. Stunning landscapes, the promotion of traditions, local food and wine production, and unspoiled natural environments characterize these villages, making them increasingly appealing not only to tourists but also to those seeking to purchase a second home or relocate permanently.

Currently, villages represent a significant part of Italy's administrative structure, with 5,521 villages accounting for 69.85% of the country's 7,904 municipalities. Their geographical distribution indicates a higher concentration in the inner areas of the peninsula, along the Apennine ridge and the Alpine arc. Since the post-World War II period, inner areas have experienced gradual depopulation, losing 900,000 residents. The population of small municipalities recorded an average annual decline of 0.2% between 1981 and 2020. This decline coincided with migratory flows of young people and an increase in the average age of residents, with 17.6% of the population now over the age of 65.

Culturally, villages represent a substantial part of Italy's heritage, encompassing 31.1% of sites and assets and 32.8% of museums. Their impact on food and wine culture is equally significant, with 90% of PDO (Protected Designation of Origin), PGI (Protected Geographical Indication), and *slow-food* products originating from small municipalities (ISTAT, 2023).

Associations such as *Borghi più belli d'Italia* (Most Beautiful Villages of Italy) and *Borghi Autentici d'Italia* (Authentic Villages of Italy) play a crucial role in identifying the most beautiful villages. Beyond creating networks and sharing enhancement projects, these associations work to promote these areas nationally and internationally, fostering tourism and local economic development while ensuring the preservation of artistic and cultural heritage.
Exploring these gems scattered throughout Italy is made possible through the associations' websites, categorized by region. Additionally, the television program *Borgo dei Borghi* (Village of Villages), broadcast by RAI, annually ranks Italy's most beautiful villages, allowing the public to vote for their favorite. Municipalities meeting the criteria can apply for the prestigious recognition of being named the "most beautiful village in Italy" (Bacilieri C., 2021). These picturesque settlements can be divided into three main

their regional contexts. Many of these communities require focused attention and support to ensure their vitality and prosperity in the modern era.
Dabimus. (2024). Home. Retrieved December 16, 2024, from https://www.dabimus.com/

categories: coastal, hillside, and mountain villages, each with its unique characteristics and distinct atmospheres.

Coastal villages are located near the sea, enjoying a privileged position that offers not only breathtaking natural beauty but also direct access to marine resources. These villages often benefit from broader services and proximity to urban centers, making them attractive to visitors. However, some may find themselves in a state of neglect, lacking adequate administration to promote their development and enhancement.

Hillside villages, by contrast, occupy an intermediate position between valleys and hilltops, often surrounded by vineyards and scenic landscapes. These villages may enjoy better accessibility compared to mountain ones, facilitating access to essential services. Their strategic location between elevations contributes to a relatively higher quality of life, although they may still face challenges related to managing local resources.

Finally, *mountain villages* are Italy's hidden jewels, often perched on rugged peaks. While they face challenges such as limited accessibility and harsher climates, these villages retain a unique authenticity and charm. Their traditional architecture, often untouched by recent restoration efforts, bears witness to a history and culture that endure over time. Geographic isolation makes these towns less populated but, at the same time, helps preserve their intrinsic beauty and authenticity.

I.4.2 Abandonment and depopulation

Addressing the issue of abandonment, small towns in Italy represent an alarming and widespread reality across the national territory, requiring serious attention. According to data provided by ISTAT, there are 5,627 small municipalities at risk, of which 3,532 have fewer than 2,000 inhabitants, and 2,105 fewer than 1,000 inhabitants, indicating an advanced state of depopulation. Among these, 197 villages are completely uninhabited. These communities, often consisting of clusters of houses surrounding a central square, typically the one near the main church or fountain, are located in remote and hard-to-reach areas, frequently far from major communication routes. Most of these settlements are concentrated in the Apennines and inner regions (ISTAT, 2023).

Fig. I.4.1.1 | Fontainemore, Aosta Valley - Alpine Village ©Borghi più belli d'Italia, 2024.

Fig. I.4.1.2 | Pomponesco, A Small County Behind the Embankment - Lombardy ©Borghi più belli d'Italia, 2024.

Fig. I.4.1.3 | Campiglia Marittima, A Hymn with All the Shades on Nature's Musical Staff - Tuscany ©Borghi più belli d'Italia, 2024.

Fig. I.4.1.4 | Sepino, At the Crossroads of the Tratturi - Molise ©Borghi più belli d'Italia, 2024.

More than mere clusters of houses, these villages are custodians of invaluable local identities. Through their way of life, methods of construction, and inhabitation patterns, they offer a glimpse into the past and the relationship between communities and the surrounding landscape. However, the abandonment of small towns in Italy has deep roots, dating back to the post-World War II period. During the economic boom, there was a massive exodus as people migrated to cities in search of jobs and prosperity, leading to the abandonment of agriculture in favor of industrialization. Adding to this analysis is the exodus of countless young people who, due to a lack of job opportunities, left southern Italy to settle in the north or abroad in search of better working conditions. Moreover, some villages were entirely abandoned either because schools were closed (Milani, R. (Director). (2024). *Un mondo a parte* [Film]. Medusa Production) or due to natural disasters rendering them uninhabitable.

Calabria holds the record with 20 abandoned villages, followed by Tuscany and Piedmont, each with 19 abandoned settlements. Abruzzo and Liguria follow with 17 each, and Sardinia with 16. Notably, all regions, including those with strong economies, have at least one abandoned village. However, the Alps, with their robust economies, have not experienced depopulation to the same extent as the Apennines. Valle d'Aosta, Trentino-Alto Adige, Veneto, and Friuli Venezia Giulia, with a limited number of abandoned villages, clearly reflect this difference.

The number of abandoned towns in Italy (ISTAT, 2023) exceeds a thousand, reaching about 6,000 when small residential clusters and alpine pastures are included.

Italy is witnessing a decline in its population. In 2018 alone, the Italian

[1] European regulations supporting *Smart Villages* are part of a broader strategy aimed at promoting sustainability, competitiveness, and social inclusion in the rural areas of the European Union.

One of the main initiatives at the European level is the "EU Cohesion Policy," which encompasses various actions and programs designed to foster the economic and social development of EU regions, including rural areas. In particular, the European Regional Development Fund (ERDF) and the European Social Fund (ESF) are two key instruments for financing projects that promote innovation, employment, education, and sustainable development in rural areas.
Some of the key European initiatives supporting *Smart Villages* include:
The EU Strategy for Rural Areas: The European Commission has developed a dedicated strategy to foster innovation, employment, and quality of life in rural communities. This strategy promotes the use of digital technologies and access to high-speed internet in rural areas.
Broadband Initiative for Europe: L'UE si è impegnata a fornire una connessione a internet ad alta velocità e a copertura totale a tutte le aree dell'UE entro il 2025. Ciò include anche le zone rurali, contribuendo a ridurre il divario digitale tra aree urbane e rurali.
Horizon Europe Program: This EU research and innovation program supports projects that advance technological innovation and sustainable development in rural areas. It provides funding for initiatives addressing the challenges faced by rural communities with innovative solutions.
LIFE Program: This program funds projects aimed at environmental protection and the transition towards a sustainable economy in rural areas.
LEADER Program: This program provides financial support for rural and local development initiatives, often based on partnerships between local communities and public authorities. Projects address various themes, including sustainable agriculture, rural tourism, cultural heritage valorization, and employment promotion.
WiFi4EU Initiative: This program offers funding for the installation of free public Wi-Fi access points in public spaces, including rural areas, to improve internet access for citizens.
Council of the European Union (2023, November 20). A long-term vision for the EU's rural areas: Council approves conclusions. European Union. https://europa.eu/!YY84Cq

Fig. I.4.1.5 | Cisternino, L'abbagliante kasbah della valle d'Itria - Puglia ©Borghi più belli d'Italia, 2024.

population decreased by 124,427, bringing the total population below 60 million. Without the contribution of foreign nationals, from 2011 to 2019, the Italian population would have decreased by over 800,000. The phenomenon of depopulation is thus an established fact. These trends, linked to an aging population and declining birth rates, became even more concerning in 2020 due to increased mortality caused by COVID-19 (ISTAT, 2023).

It is worth noting that such statistics are not uniformly distributed across the national territory. Demographic trends vary significantly: the population is growing in northern and central regions while declining in the south.

Furthermore, there is population growth in urban and coastal areas, contrasted by decreases in small towns and inner areas. The National Institute of Statistics (ISTAT) provides a detailed picture of these dynamics through the Permanent Census of Population and Housing. Unlike the decennial censuses conducted before 2011, the current methodology is based on a significant annual sample, providing constantly updated information on various aspects of Italian life. Data from 2018 and 2019 published by ISTAT, including a specific focus on The Most Beautiful Villages in Italy, offer additional details. Of the 307 municipalities awarded this title, interesting and representative demographic trends emerge concerning depopulation dynamics, particularly in small municipalities in inner areas.

Between 1951 and 2019, only 12 of these municipalities recorded consistent population growth, while 83 experienced continuous depopulation. The foreign population has proven crucial in mitigating demographic losses, with a significant increase after 2001. However, the analysis shows that villages with fewer than 10,000 inhabitants, especially those under 3,000, are the most affected, with a decrease of nearly 300,000 people since 1951.

Despite an overall population loss in villages of approximately 185,000 individuals between 1951 and 2019, a reversal of this trend has been observed since 2001, thanks to immigration. This phenomenon intensified after 2011, particularly in medium-sized municipalities (5,000–15,000 inhabitants).

Currently, the foreign population accounts for 7% of the population of the 307 most beautiful villages in Italy, a significant increase from 2.2% recorded in 2001. This foreign population is young and exhibits a higher fertility rate than the Italian average, suggesting a potential contribution to slowing depopulation in Italy.

Strategies to counteract this phenomenon include initiatives to repopulate villages by leveraging their tourism potential and investing in digital infrastructure to enable remote work. The pandemic and ecological crisis may encourage a more sustainable lifestyle in villages. However, decisive political and economic commitment is essential to ensure the success of these initiatives. The National Strategy for Inner Areas (SNAI), launched in 2012, represents a significant example, albeit with some critical aspects, of an initiative to counter depopulation and revitalize territories. Its revival could significantly contribute to mitigating the phenomenon on a national scale.

I.4.3 A new life for minor Italian villages

In Italy, the idea of creating *Smart Villages*[1] in small towns, or rather, villages, is gaining increasing traction as an innovative solution to revitalize these rural areas, mitigate abandonment, and promote sustainable development while embracing modern digital technologies. In recent years, tourism focused on exploring Italian villages has seen significant numbers of visitors, generating growing interest and success.

Smart villages in Italy can be distinguished by several key features. First, they promote the adoption of high-speed connectivity, *IoT* (*Internet of Things*) solutions, and digital applications to improve services and stimulate innovation. Additionally, they place strong emphasis on sustainability by enhancing local resources, promoting energy efficiency, renewable energy use, sustainable land management, and eco-friendly agricultural practices.

Finally, they are committed to preserving and enhancing cultural heritage, promoting the safeguarding of traditions, local productions, historical and artistic sites, and local architecture.

The benefits that *Smart Villages* bring to rural communities are manifold. First, they stimulate economic development by attracting new businesses and investments, promoting the sustainable growth of local activities through innovation and entrepreneurship. Moreover, the adoption of digital technologies and innovative solutions improves access to essential services, such as healthcare, education, transportation, and security, contributing to a better quality of life for residents. From an environmental perspective, they encourage sustainable practices and a transition toward a low-carbon economy by using renewable energy, efficiently managing resources, and promoting sustainable agriculture. Furthermore, they promote the preservation of rural communities' cultural identity by enhancing traditions, culture, and local heritage, and encouraging sustainable tourism and the promotion of local products. Finally, they aim to improve the accessibility of these areas. They represent an innovative model for rural development in Italy. The idea is that, in the near future, *Smart Villages* will become increasingly widespread in Italy, following the example of what has already happened in other European and non-European countries, but also drawing inspiration from several Italian cases already undertaken. Currently, there are various types of rehabilitation and enhancement projects for abandoned or at-risk villages, each with specific objectives, particularly:

- **tourist-real estate:** this is the most popular form of redevelopment as it ensures a quick return on investments. The main focus is the transformation of existing buildings, even in a state of disrepair, into accommodation facilities or private residences. An example of this is the "*alberghi diffusi*" model, where the reception area is in a central building in the town and the rooms for hosting tourists are in surrounding houses, representing the most common and replicated model;
- **productive:** from ancient factories to modern start-ups, from university research centers to agricultural enterprises. An example is Solomeo, in the province of Perugia, which has been transformed into a center for cashmere production;
- **social:** promotes local communities, develops innovative services, and builds supportive networks. The active involvement of various *stakeholders* is essential to foster the economic, social, and cultural growth of the community. Although there are no pure examples of *Social Housing*, forms of *Co-Housing* are being experimented with in places like the Torri Superiore village in Liguria;
- **creative:** focuses on art, culture, and entertainment. Activities range from the establishment of artistic communities to the organization of workshops, internships, artistic productions, and cultural events. Interaction with artists and cultural figures contributes to creating an organizational network and spaces to host events;
- **work of art:** uses creativity as a driving force for the development of smaller centers, enhancing the natural landscape and architectural heritage to attract new tourists in an alternative way.

In Italy, numerous successful practices have been implemented that can be considered early examples of "*Smart Villages*". However, to further promote the adoption of these development practices, it is essential to implement supportive policies and undertake additional initiatives involving multiple strategies. This can be achieved through dedicated funding, such as European, national, and regional funds for innovation and rural development projects, as well as through forms of collaboration between private entities, citizen initiatives, and partnerships with universities and research organizations. It is crucial to encourage collaboration between institutions to successfully implement *Smart Village* projects by combining expertise, resources, and knowledge. Actively involving the local community in the decision-making process and the management of *smart villages* fosters the sustainability

[1] Una delle prime realtà italiane a trasformarsi in *Smart Village* è stato il comune di Sellia, in provincia di Catanzaro. Grazie ai fondi ricevuti dal PNRR, sono in corso di adozione diverse soluzioni *smart*. Tra queste, c'è l'acquisto di veicoli elettrici: scuolabus e mezzi per le pulizie stradali. Panchine intelligenti consentiranno la ricarica di smartphone e monopattini. Una rete di sensori segnalerà il malfunzionamento dei lampioni, il livello di riempimento dei cestini dell'immondizia ed eventuali perdite nella rete idrica. Inoltre, le nuove tecnologie di monitoraggio ambientale permetteranno di mitigare i rischi di dissesto idrogeologico e incendio. E poi non manca l'attenzione alla salute. In paese è già attiva una "health station", una stazione medica che misura diversi parametri vitali dei cittadini quali temperatura corporea, peso, pressione sanguigna e saturazione dell'ossigeno. Santa Flora, in provincia di Grosseto, dal 2020 si propone come "Smart Working Village". Dopo avere installato la banda larga in paese, l'amministrazione comunale intende ripopolare il comune ospitando chi lavora a distanza. Oltre a infrastrutture digitali dalle elevate prestazioni, il progetto prevede incentivi sugli affitti, così da attirare nella località il popolo degli *smart worker*. Sulla stessa lunghezza d'onda è il comune di Monte San Martino, in provincia di Macerata. Anche la piccola realtà marchigiana è sulla via della trasformazione digitale. Il suo percorso prevede attività di formazione e affiancamento rivolte alla comunità locale e il lancio di servizi di co-working e accoglienza pensati per chi vuole lavorare a distanza. Sull'Appennino genovese, l'Unione dei comuni delle Valli Stura, Orba e Leira punta invece sulla mobilità sostenibile. A beneficiarne sarà la popolazione dei comuni di Mele, Campo Ligure, Masone, Rossiglione e Tiglieto. Grazie ai fondi europei, è stato infatti istituito un servizio gratuito di bus a chiamata che collega le Valli del SOL a Genova.

Fig. I.4.1.6 | San Marino, un mondo unico al mondo ©Borghi più belli d'Italia, 2024.

of initiatives and creates a sense of belonging and active participation.
The Covid-19[2] pandemic has made it necessary to reconsider traditional development models, opening the way to new possibilities and solutions. This crisis highlighted the importance of a careful and gradual approach to transition, with a renewed awareness of the innovative challenges facing Italy's inner areas. The need to develop new ideas and development paradigms became more evident, bringing to light the problems caused by excessive urbanization and mobility, which contributed to the spread of the virus. This awareness has driven the consideration of social and urban decentralization solutions as a response to the current crisis, but also as an opportunity for secure and sustainable development. Examples include the first villages created to meet the need for *smart* working. Furthermore, the issue of depopulation in small municipalities and the desertification of decentralized areas has become even more pressing. In this context, *Smart Villages* present themselves as an innovative model for rural development; in 2023, there are many first smart examples across all Italian regions, the majority of which are located in the mainland, with only a few, very few examples in Southern Italy and the islands. These examples feature a variety of projects and initiatives. The most common topics addressed include:

- **improvement of energy efficiency in buildings:** The use of advanced technologies to reduce energy consumption and promote sustainable energy sources;
- **sustainable mobility:** The adoption of eco-friendly transportation solutions such as electric vehicles or shared bicycles;

Fig. I.4.1.7 | Borgo costiero di Vernazza, Liguria. © Si Viaggia, MartinM303 2019.

Fig. I.4.1.8 | Borgo collinare di Brisighello, Emilia Romagna. © Travel The Wom, 2019.

Fig. I.4. 1. 9 | Borgo montano Brindisi di Montagna, Basilicata. © Si Viaggia, Michele Luongo, 2019.

[2]L'articolo del 27 settembre 2020 discute il fenomeno turistico che ha caratterizzato l'estate dello stesso anno, evidenziando un aumento significativo delle visite ai borghi italiani. La ragione principale di questo incremento risiede nel desiderio di evitare sovraffollamenti in destinazioni tradizionali e di scoprire prodotti e tradizioni meno conosciuti, una tendenza amplificata dall'emergenza COVID-19. Secondo un'analisi della Coldiretti, due italiani su tre hanno scelto di trascorrere le loro vacanze estive nei borghi italiani. Tale scelta è stata motivata anche dal crollo del 72% degli arrivi turistici nei paesi dell'Europa meridionale nel primo semestre dell'anno, come riportato dall'Organizzazione Mondiale del Turismo. Il turismo di prossimità ha registrato un aumento significativo, con un quarto degli italiani che ha optato per destinazioni vicino casa, all'interno della propria regione di residenza. Questo fenomeno è stato favorito dalla presenza diffusa di piccoli comuni, che offrono un ricco patrimonio naturale, paesaggistico, culturale e artistico. Le visite ai borghi sono state trainate principalmente dalla ricerca di prodotti enogastronomici tipici del territorio. I souvenir preferiti dagli italiani durante l'estate 2020 sono stati i formaggi, seguiti da salumi, vino e olio extravergine d'oliva. La ricerca di prodotti tipici è diventata un elemento imprescindibile delle vacanze in Italia, considerato il ruolo di leadership del paese nel turismo enogastronomico, con una vasta gamma di specialità e vini a indicazione geografica riconosciuti a livello comunitario.
L'ospitalità nei piccoli centri è stata garantita principalmente dalle strutture agrituristiche, che offrono un ambiente familiare, posti letto limitati e ampi spazi all'aperto, ideali per rispettare le misure di sicurezza anti-COVID. Durante il mese di settembre, si è stimato un elevato numero di presenze in queste strutture, che consentono ai turisti di godere della buona cucina e di partecipare ad attività autunnali tradizionali. Il presidente di Coldiretti, Ettore Prandini, ha sottolineato l'importanza del turismo nei piccoli borghi come risorsa strategica per il rilancio economico e occupazionale del paese dopo la crisi sanitaria. *Tratto da ANSA, [ultimo aggiornamento: 29 dicembre 2021]*

- **smart waste management:** The implementation of more efficient waste collection systems and recycling;
- **security:** The use of surveillance systems and other technologies to ensure community safety;
- **promotion of sustainable agriculture:** The use of advanced agricultural technologies to improve the productivity and sustainability of local farming;
- **enhancement of cultural heritage:** The preservation of cultural and historical traditions through tourism and cultural promotion initiatives.

Furthermore, they offer a range of benefits to rural communities, including:

- **improvement of quality of life:** Access to advanced and sustainable services, from healthcare to education, enhances residents' lives;
- **promotion of sustainability:** The adoption of renewable energy and eco-sustainable agricultural practices contributes to environmental protection;
- **technology and innovation:** The implementation of digital technologies stimulates economic and social innovation;
- **attraction of new investments:** *Smart Villages* become attractive for new investments, promoting economic growth;
- **creation of new jobs:** *Smart Village* projects often generate large, important, and essential local job opportunities.

On the global stage, as extensively explored in the previous sections, there is an increasing importance of services and the adoption of digital approaches across various sectors. However, in Italy, this transition is often slowed down by an architectural heritage of immense value and prestige. It is not, in fact, easy to introduce technologies and digitalisation into well-preserved contexts. Italy, with its rich history and unique architectural characteristics, faces particular challenges in the rapid implementation of new technologies.

The slow adoption of technological systems can be attributed to the need to reconcile innovations with architectural contexts steeped in history and tradition, where the features are not only evident but often binding, especially regarding architectural heritage. Introducing digital solutions in environments characterized by ancient building structures can prove to be a complex, laborious, and extremely difficult process.

The challenges arise not only at the technological adaptation level but also due to the stringent regulations aimed at preserving the country's cultural heritage. The safeguarding of historic buildings, monuments, and archaeological sites imposes limitations and requires a careful, respectful, and compatible approach. As a result, while in the rest of the world the adoption of advanced technologies is often quick and seamless, in Italy there is a more measured balance between the heritage of the past and the needs of the present.

On the one hand, this approach reflects the desire to preserve cultural heritage, but on the other hand, it can cause some delay in the adoption of new digital solutions, even when these could bring significant improvements in terms of efficiency and services. However, by using advanced technologies and the participatory approach of the community, it is possible to improve the quality of life in rural areas, stimulate economic growth, and promote sustainability. The widespread adoption of these models will depend on the presence of supporting policies at the national and regional levels and the collaboration between public and private sectors to successfully implement the initiatives of *Smart Villages*.

For the Italian case as well, within the European *Smart Villages*, summary sheets have been drafted for the case studies analyzed, which have adopted virtuous processes of regeneration and urban revitalization, qualifying them as *Smart Villages*.

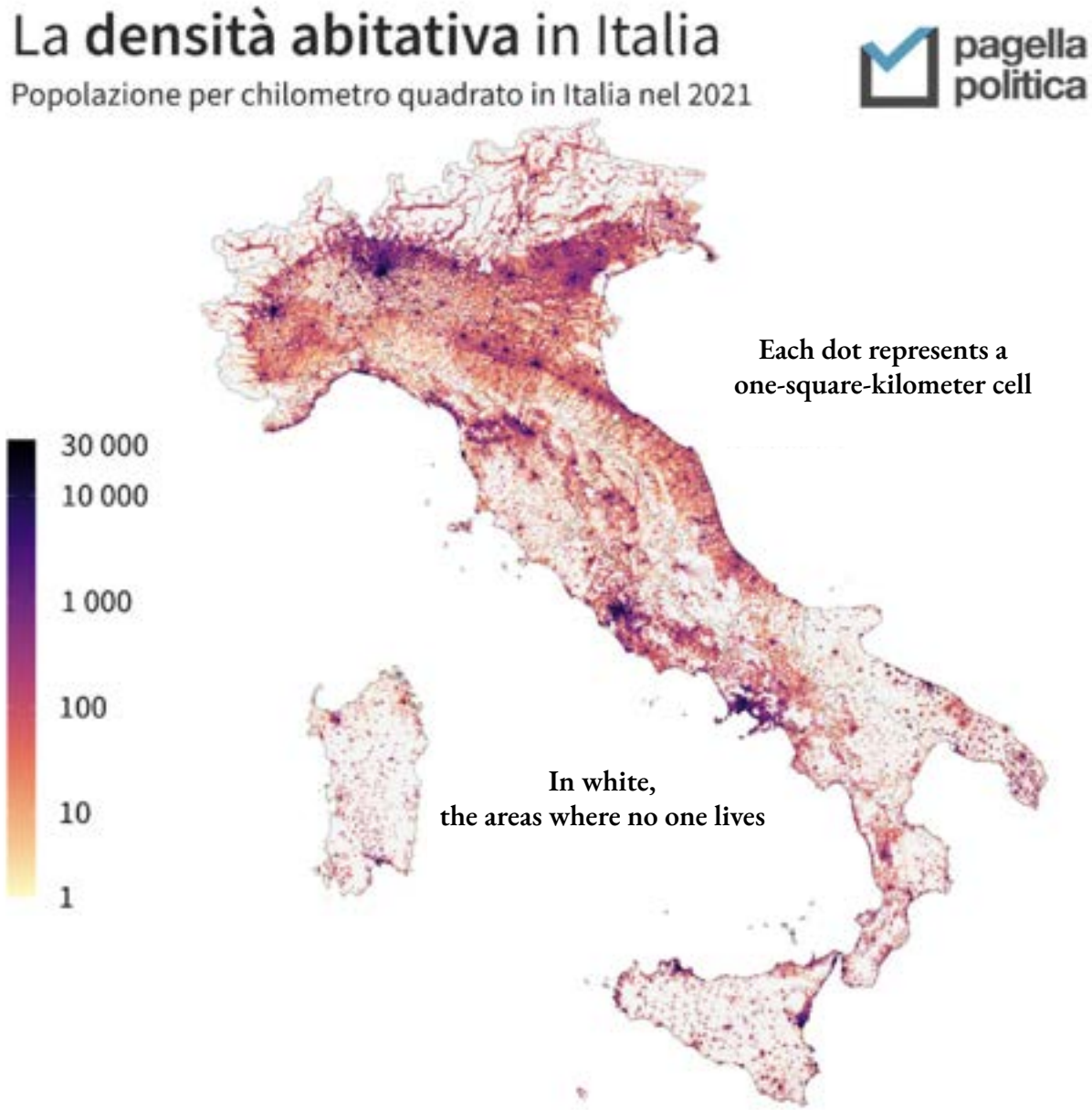


Fig. I.4.1.10 | Population density in Italy ©Pagella Politica, 2021.

Fig. I.4.1.11 | Santa Fiora, one of the first smart villages in Italy through the implementation of smart working © Si Viaggia 2022.

ITALIAN GHOST VILLAGES

NORD

LOMBARDIA
Assiano
Borgo del Conte
Castel Liteggio
Corsonno
Daslie
Monteviasco
Mulini di Piero
Pagliari
Vaiano Valle

LIGURIA
Balestrino
Bussana Vecchia
Brugosecco
Cà di Ferré
Canale di Maniglia
Case Velxe
Costa di Soglio
Cravarezza
Caselle
Lavazzuoli
Flettino

PIEMONTE
Avi
Reneuzzi
Antrona
Aramolo
Brusaschetto Basso
Casoni di Vegni
Connio
Ferrazza
Leri Cavour
Narbona
Semermorello
Torrione

EMILIA ROMAGNA
Bastia
Durazzo
Borgata La Cà
Castel d'Alfero
Cerreto di Saludecio
Sant'Antonio
San Paolo in Alpe
Lavacchielli
Pastorale

TRENTINO ALTO ADIGE
Borgo Carrero
Curon Vecchio
Irone

FRIULI VENEZIA GIULIA
Palcoda
Moggessa di Qua
Moggessa di Là
Pozzis

VALLE D'AOSTA
Barmaz
Fornet

VENETO
California
Fumegai
Orsetti
Poveglia

CENTRO

TOSCANA
Rocca San Silvestro
Bacchionero
Buriano
Bugnano
Canneto
Castiglioncello
Fabbriche di Careggine
Formentara
Toiano
Vetriceto
Roveraia

LAZIO
Anturi
Monterano
Celleno
Civita di Bagnoregio
Camerata
Chia
Faleria Antica
Montecoccioli
Norchia
Reopasto
Stazzano

MOLISE
Pesche
Ripalimosani
Rocchetta Alta

ABRUZZO
Altovia
Albe Vecchia
Buonanotte
Faroone
Frattura
Frunti (Solignano)
Gessopalena
Lafuto
Lecce nei Marsi
Marfese
Serra
Stivigliano
Tavolero
Torre di Sperone
Valle Pezzota
Valle Piola

MARCHE
Castelnuovo di Auditore
Gesso
Tavernelle
Vasci
Cossinino da Piedi
Elcito

UMBRIA
Biselli
Marzana
Scoppio
Umbriano

SUD

CALABRIA
Africo
Avena
Amendolea
Brancaleone
Campana
Acerenthia
Carello
Ceella Vecchia
Campana
Casalinuovo di Africo
Cavallerizzo di Cerzeto
Fantino
Roghudi
Saguccio
Ferruzzano
Gumeno
Laino Castello
Nicastrello
Papaglionti
Pentedattilo
Perlupo

CAMPANIA
Apice
Roscigno
Aquilonia
Sacco
San Severino di Centola
Castelpoto
Corza della Campania
Croce
Fondola
Melito Irpino
Romagnano al Monte
Sarbo
Tocco vecchio
Senerchia
San Felice

PUGLIA
Balsignano
Monterugo
Rione dei Fossi
Roca Nuova
San Nicola

BASILICATA
Craco
Campomaggiore Vecchia
Allanello Vecchio
Taccone
Brienza
Rabatana

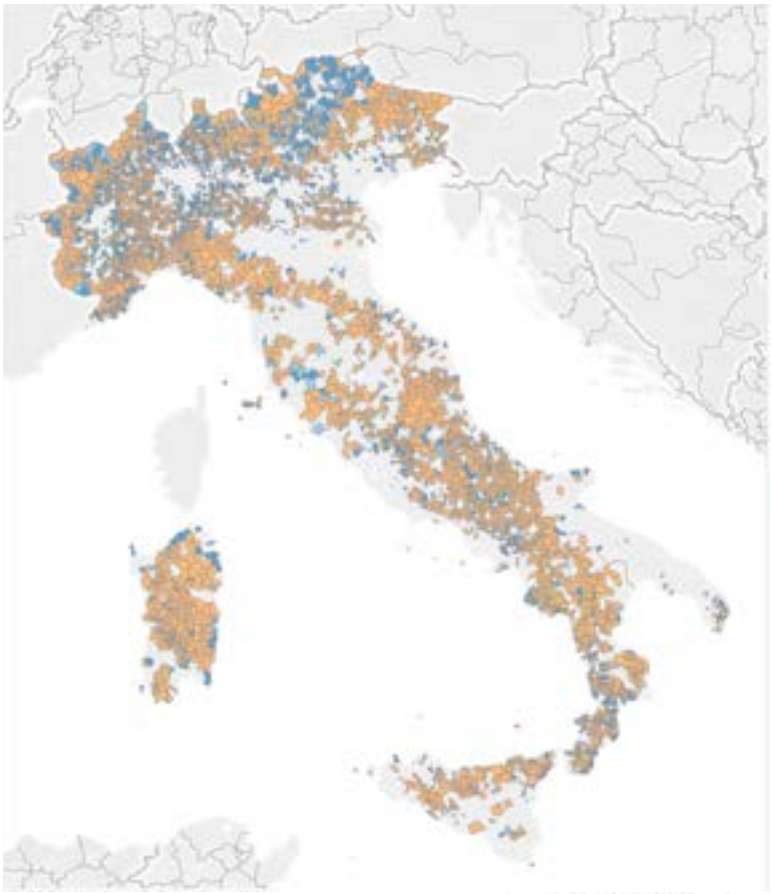
ISOLE

SICILIA
Bazzina Alta
Borgo Baccarato
Borgo Borzellino
Borgo Schirò
Cunziria
Gibellina
Massa San Nicola
Poggioreale
Scurati

SARDEGNA
Gairo Vecchia
Naracauli
Orbai
Osini
Villaggio Asproni
Trofalias

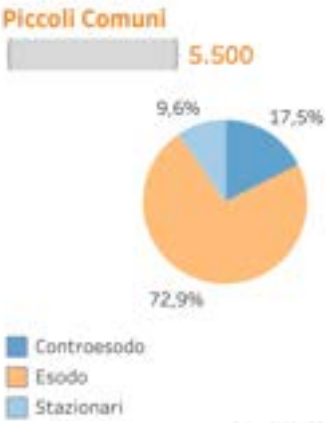
Fig. I.4.1.12 | List of some of the Italian ghost villages. © Luisa Lombardo, 2023.

ATLAS OF SMALL MUNICIPALITIES



Overall, there are 5,500 Small Municipalities, representing 69% of the Italian municipalities, with 10,068,213 residents, accounting for 17% of the national population. The regions with the highest number of small municipalities are Piedmont (1,046) and Lombardy (1,043). Most small municipalities have a population between 1,001 and 3,000 inhabitants (45.8%), while municipalities with populations under 1,000 inhabitants make up 33.6% of the total.

Source: ANCI processing based on ISTAT data and the Agency for Territorial Cohesion.



	Numero di Piccoli Comuni	Popolazione legale 2011
PIEMONTE	1.046	1.305.774
VALLE D'AOSTA	73	92.704
LOMBARDIA	1.043	2.097.223
TRENTINO-ALTO ADIGE	256	455.679
VENETO	289	747.112
FRIULI-VENEZIA GIULIA	151	278.111
LIGURIA	182	246.230
EMILIA-ROMAGNA	135	362.755
TOSCANA	119	289.667
UMBRIA	61	134.402
MARCHE	160	320.231
LAZIO	254	461.258
ABRUZZO	250	356.367
MOLISE	125	153.962
CAMPANIA	335	693.521
PUGLIA	84	215.437
BASILICATA	99	191.044
CALABRIA	322	646.343
SICILIA	202	493.766
SARDEGNA	314	526.627
Totale	**5.500**	**10.068.213**

Zona altimetrica

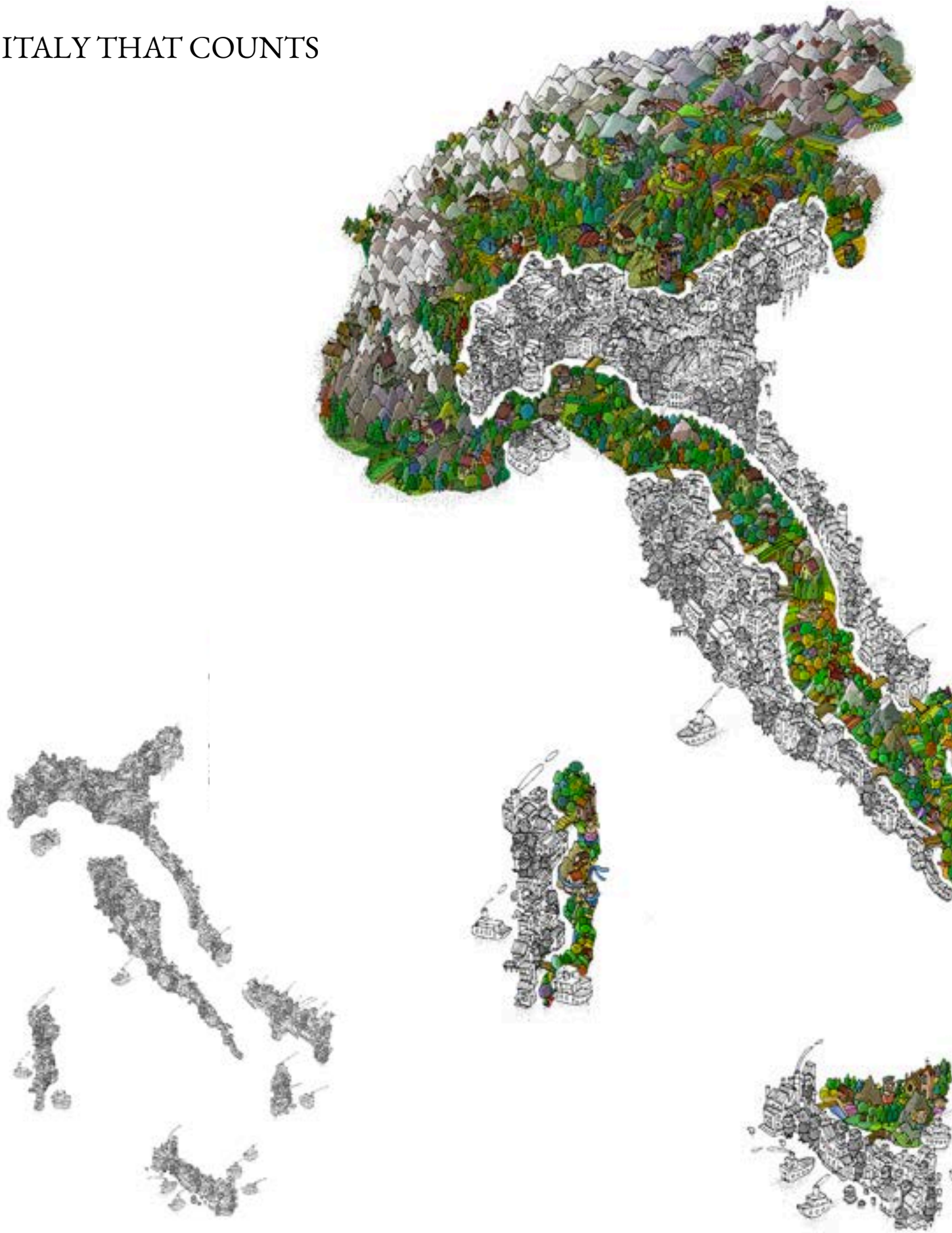
	Montagna interna	Montagna litoranea	Collina interna	Collina litoranea	Pianura	Totale
Controesodo	16,0%	8,5%	15,5%	24,4%	22,7%	**17,5%**
Esodo	75,2%	85,4%	75,7%	65,5%	64,4%	**72,9%**
Stazionari	8,8%	6,1%	8,8%	10,1%	12,9%	**9,6%**
Totale	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Aree interne

	Piccoli Comuni in Area Interna		
	No	Si	Totale
Controesodo	26,2%	12,2%	**17,5%**
Esodo	60,6%	80,4%	**72,9%**
Stazionari	13,3%	7,3%	**9,6%**
Totale	**100,0%**	**100,0%**	**100,0%**

SOME DATA REGARDING ITALIAN VILLAGES

ITALY THAT COUNTS



Graphics | LANDS OF NO ONE. FAI - Italian Environmental Fund. | XXIV National Conference of FAI Delegates and Volunteers © Lorenzo Terranera, 2020.

5.308
abandoned villages

72 %
ghost towns

1/5
italian population living in a small municipality

2.831
municipalities at risk of disappearance

100,000 square
kilometers of Italian territory

> central-southern Italy
> Apennine areas

I.4.4 The rebirth of the Apennines

The mountains of the Apennines[1], although they may have been overshadowed by the fame of the imposing Alps, proudly claim a vast geographical extent and a historically significant influence within the Italian peninsula. Functioning as a backbone that traverses the boot, the Apennines not only divide Italy into two distinctive macroregions but have also profoundly shaped the culture, economy, and national identity over the centuries. Since Roman times, the Apennines have served as a fundamental communication route, facilitating trade and the spread of cultures among various populations. Its lush forests and fertile lands have supported agriculture and pastoralism for millennia, contributing to the prosperity of the peninsula (Ciuffetti, 2019). Moreover, the Apennines have inspired a multitude of artists and writers, including Dante Alighieri and Francesco Petrarca, who exalted its scenic beauty and symbolic significance.

Despite its glorious past, the Apennines today face a series of significant challenges. The abandonment of its inner areas, stemming from a complex combination of factors including the lack of services, access difficulties, and a lack of employment opportunities, has led to demographic and economic decline (Dematteis, 2020). This marginalization has also triggered environmental degradation and biodiversity loss; official data from the National Institute of Statistics (ISTAT) confirms this issue, showing a 15% population decline in the Apennine inner areas between 2001 and 2021.

In 2023, the youth unemployment rate in these areas was 25%, three times the national average of 10%. Over the past decade, the number of farms in the Apennines has dropped by 20%.

However, an opportunity for the rebirth of the Apennines appears on the horizon thanks to the *Smart Villages* strategy, requiring tangible commitment and a long-term strategic vision.

It is imperative to intervene in several key areas:

- **infrastructure and digitalisation:** Invest in digital and transportation infrastructure to improve connectivity and accessibility of inner areas;
- **economic development:** Promote the development of sustainable economic activities, such as agritourism, ecotourism, and artisanal manufacturing;
- **territory enhancement:** Encourage the regeneration and rehabilitation of small centers and the enhancement of cultural and landscape heritage;
- **support policies:** Promote policies that support families and businesses choosing to settle and operate in the Apennines.

Only through coordinated and resolute action will it be possible to turn current challenges into opportunities for growth and sustainable development for the entire Apennine region.

Below is an overview, through infographics, of the social dynamics and marginalization of the Apennine lands, taken from the Press Review of the Chamber of Deputies on Sunday, March 17, 2024, by Data Stampa, which shows the conditions of the Apennines in 2024 following the recently completed national strategies for territorial revitalization.

[1] The Apennines constitute the Italian backbone, tangibly connecting the two sides of the peninsula. It is a heterogeneous space with multiple geo-morphological, ecological, historical, anthropological, social, and institutional characteristics. It is the result of a long process of co-evolution between humans and the environment, marked by continuity and fractures, which has deposited material and cognitive sediments that are constantly evolving and transforming. For centuries, this ridge has maintained rich natural biodiversity and provided essential ecosystem services, such as water crucial for the development of proto-industrial activities. Forests and grazing lands have supported an agro-silvo-pastoral economy based on multi-activity, with practices reminiscent of common goods and civic uses, contributing to the creation of specificities still observable in the local landscape and culture...

Looking to the future, to foster the rebirth of the Apennines, alongside place-based policies aimed at promoting employment, enhancing infrastructure, and ensuring efficient transport, improving access to healthcare services and quality education, it becomes essential to also focus on the care and maintenance of the territory. This aspect forms a fundamental precondition for the prevention of environmental and anthropic risks.
Source: Carallo S. (2024) Appennini, in Tomeo N. (ed.) 2024. Vocabolario delle aree interne. 100 parole per l'uguaglianza dei territori. Radici Edizioni.

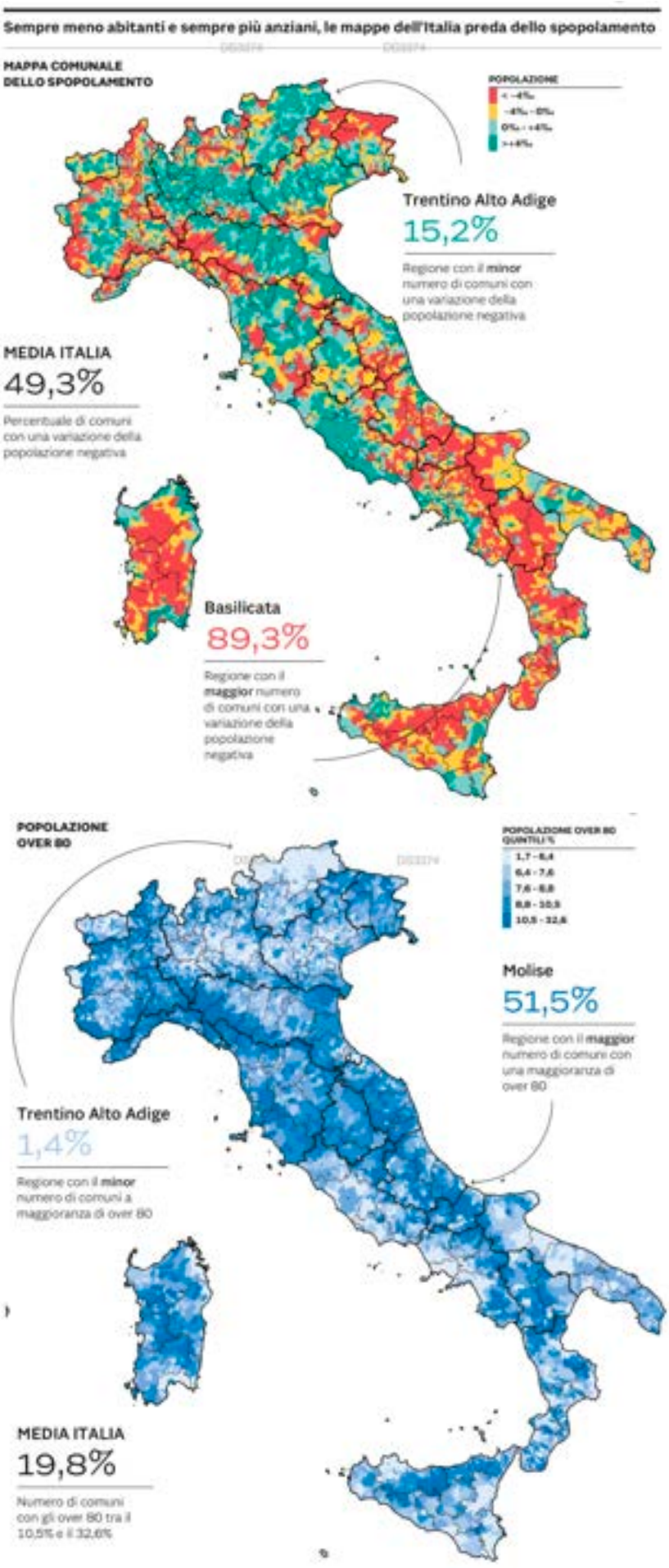


Fig. I.4.4.1 | Press Review Chamber of Deputies, March 17, 2024 (curated by Data Stampa)

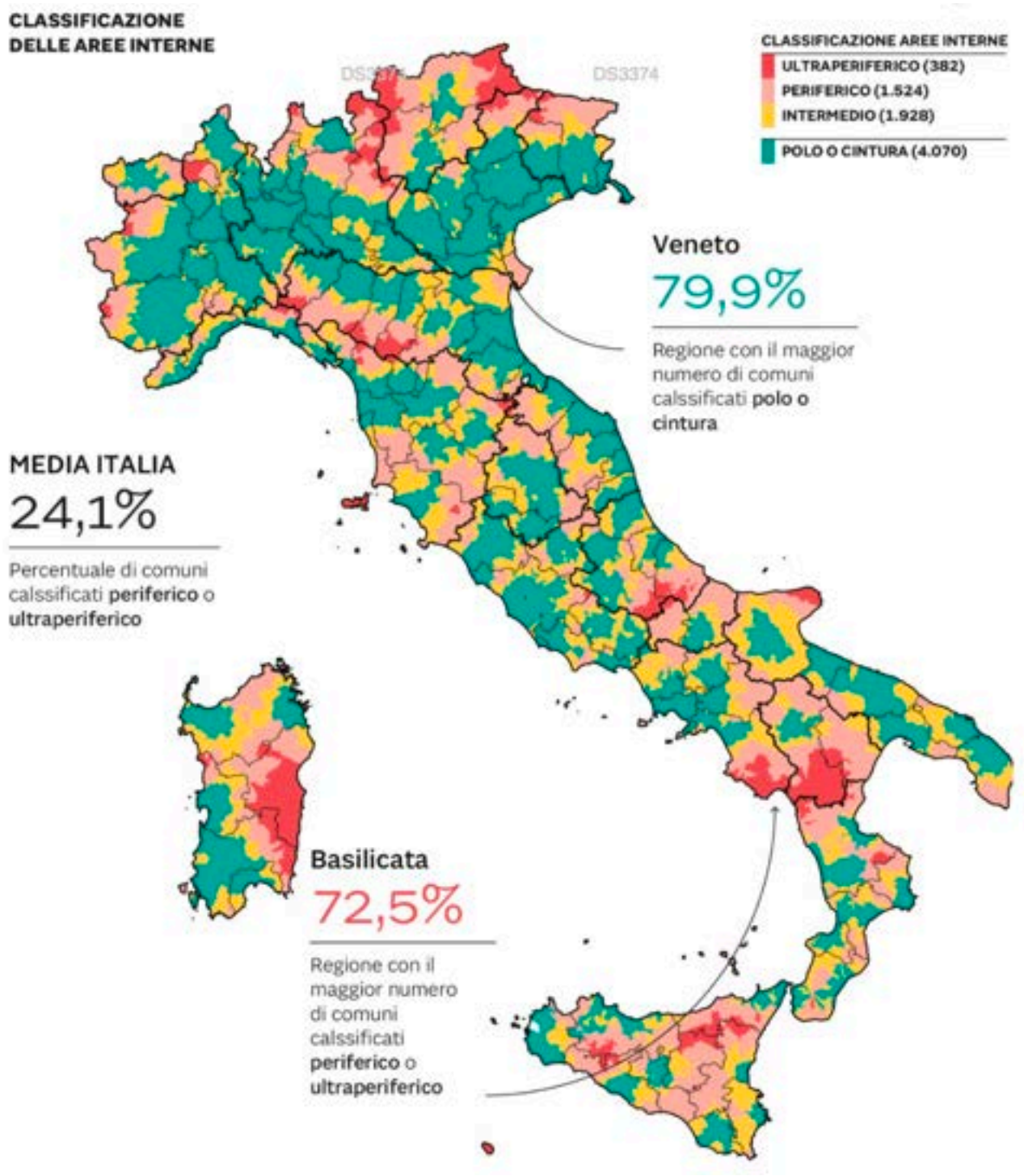


Fig. I.4.4.2 | Press Review Chamber of Deputies, March 17, 2024 (curated by Data Stampa)

The image represents the distribution of ultra-peripheral, peripheral, and intermediate areas in Italy, highlighting territorial disparities between different regions. In particular, a significant peak is observed in Veneto and Basilicata. Veneto is the region with the highest number of municipalities classified as hubs or belts, located in strategic positions relative to surrounding areas and promoting development and centrality. In contrast, Basilicata stands out for the higher number of peripheral and ultra-peripheral municipalities, which face challenges related to distance from major urban centers and difficulty accessing resources and services. This pattern emphasizes the importance of development and integration policies to reduce territorial inequalities and promote balance among the country's various areas.

«In gioco il futuro del Paese ma ogni area richiede soluzioni caso per caso»

L'intervista. Cecilia Tomassini. «È necessario affrontare il tema del welfare e dell'assistenza»

Non ha funzionato l'idea che la crescita sarebbe partita dai centri urbani per arrivare alle periferie
Carlo Marroni

«Comprendere bene il fenomeno delle aree interne è essenziale per il futuro dell'Italia, sia per il controllo e la vitalità del territorio, ma anche per rappresentatività politica, quindi un tema di democrazia. Serve una politica a lungo termine, ma con un'avvertenza: ogni area è diversa, non c'è un unico approccio valido per tutte. Il fenomeno va studiato a fondo, e di continuo». Cecilia Tomassini, professoressa ordinaria di Demografia presso l'Università del Molise, lavora da anni in équipe dentro il suo ateneo sul tema delle aree interne, che si lega alle molte problematiche dell'Italia, a partire dall'inverno demografico.

Partiamo da qua, dal numero di italiani che cala costantemente.
L'Italia perde popolazione dal 2015 – eravamo 60,7 milioni, ora siamo sotto 59 – ma il fenomeno non è uniformemente distribuito sul territorio. Si conoscono bene le dinamiche demografiche Nord-Sud: ad un settentrione più vivace dal punto di vista demografico, grazie ad un saldo naturale (nascite meno morti) seppure negativo in parte compensato da un saldo migratorio positivo (immigrati meno emigrati), si contrappone un Mezzogiorno in notevole difficoltà in entrambe le componenti. A queste dinamiche note, da una decina di anni vengono invece prese in considerazione anche le dinamiche che riguardano il divario centro-periferie.

Una criticità specifica immersa dentro un declino generale...
Da una parte l'Europa con due documenti nel 1999 e nel 2021, dall'altra la Strategia nazionale per le aree interne, proposta in Italia nel 2014, evidenziavano sia le criticità delle aree periferiche ma anche le potenziali opportunità. Questi documenti mettevano in luce come l'idea sviluppata negli anni del boom economico che la crescita economica e demografica partisse dai centri urbani e si diffondesse a quelli periferici in modo bilanciato e armonioso non solo non fosse vera, ma anzi avesse prodotto un maggiore divario fra centro e aree interne.

Il divario tra aree centrali e periferiche si va accentuando?
L'Italia ha una conformazione particolare delle aree interne: dalla mappa qui riprodotta possiamo notare come siano diffuse su tutto il territorio nazionale e in termini chilometrici, le distanze con i centri sono meno ampie rispetto ad altri paesi europei. Ma le problematiche sono simili: crescente fragilità economica, abbandono delle giovani generazioni, pochi servizi essenziali, disinteressamento dei governi centrali, fattori che contribuiscono ad alimentare un circolo vizioso di spopolamento, invecchiamento e marginalizzazione. Da un'osservazione generale possiamo individuare aree interne in cui questi processi sono ormai sistemici da molti anni ed altre invece che per ragioni diverse hanno frenato la caduta libera della popolazione locale. Questo ci porta ad una prima importante osservazione: essere area interna non necessariamente implica un processo spopolamento ed invecchiamento della popolazione.

Poi c'è l'invecchiamento, che colpisce di più le aree interne.
L'invecchiamento della popolazione, fenomeno che interessa, pur con intensità diversa, la maggior parte dei paesi industrializzati, è particolarmente marcato nelle aree di spopolamento sistemico, quelle cioè caratterizzate da decenni di decrescita demografica dovuta ad una dinamica naturale e migratoria negativa. La proporzione di ultra ottantenni nella mappa mostra come siano i comuni urbani quelli meno interessati al fenomeno, mentre le aree interne del paese sia per la bassa fecondità, sia per la forte emigrazione dei giovani verso i centri urbani, sia per la bassa attrattiva per le migrazioni internazionali stanno invecchiando molto rapidamente, soprattutto nel sud Italia.

Però non tutte le aree vedono lo stesso fenomeno.
Alcune aree interne del Nord Italia però (soprattutto in Trentino) non stanno sperimentando un rapido invecchiamento della popolazione, evidente invece nelle aree interne della Liguria, della Sardegna e della dorsale appenninica. Per le aree interne, l'essere "lontane" e, come abbiamo visto, essere fortemente invecchiate, può portare ad una forte richiesta di servizi di assistenza agli anziani vista la scarsità delle generazioni che possono dare aiuto informale e una certa frammentarietà della copertura di servizi sociali ed assistenziali. Questo sarà un tema molto importante per il prossimo futuro e il partenariato esteso Age-It finanziato dal Pnrr e dal ministero per la Ricerca lo sta studiando approfonditamente pensando a soluzioni innovative.

Quindi il fenomeno è monitorato, ma serve un'analisi in grado di generare decisioni.
Per capire cosa succede allo spopolamento delle aree interne occorre innanzi tutto studiare l'andamento di lungo periodo dei cambiamenti demografici: perché alcuni comuni perdono popolazione da quaranta anni, altri da venti e alcuni solo recentemente? Alcuni comuni delle aree interne, benché situati in zone di montagna, non sembrano soggetti a processi sistemici di spopolamento: potrebbe essere un buon segno nell'ottica di una nuova resilienza per i piccoli comuni delle zone interne? Se sì, perché? Quale impatto hanno le condizioni socio-economiche e infrastrutturali sul gradiente di spopolamento comunale?

Tutte domande che segnalano come sia un fenomeno molto complesso, diversificato e in movimento.
Ad esempio, agire sull'occupazione giovanile o femminile, sulle migrazioni internazionali può in qualche modo frenare la contrazione della popolazione? Creare una scuola o un ospedale può essere un deterrente per lo spopolamento? Usando metodologie innovative statistico-geografiche, ad esempio rileva come l'occupazione femminile ha un impatto positivo e significativo sulla tenuta della popolazione in alcune aree interne, ma allo stesso tempo è risultato ininfluente in altre zone: un segno evidente della diversa capacità demografica dei territori di reagire ai fenomeni economici, sociali, culturali e istituzionali.

Fig. I.4.4.3 | Rassegna stampa Camera dei Deputati, 17 marzo 2024 (a cura di Data Stampa)

La fotografia

1

LE AREE INTERNE

I Comuni periferici

Le Aree Interne sono rappresentate dai Comuni italiani più periferici, in termini di accesso ai servizi essenziali (salute, istruzione, mobilità) e quindi maggiormente distanti rispetto ai centri di offerta di servizi. La classificazione delle Aree Interne è il risultato di un percorso metodologico avviato dall'ex-Agenzia per la Coesione Territoriale, all'interno della Strategia Nazionale per le Aree Interne (SNAI), che ha visto coinvolti l'Istat, la Banca d'Italia e le Regioni. Per individuare i comuni che ricadono nelle aree interne, per prima cosa vengono definiti i Comuni "polo", cioè le realtà territoriali che offrono contemporaneamente (da soli o insieme ai confinanti):
A. un'offerta scolastica secondaria superiore completa, cioè almeno un liceo (classico o scientifico) e almeno uno fra istituto tecnico e istituto professionale;
B. almeno un ospedale con capacità operative avanzate;
C. una stazione ferroviaria medio-piccola con più di 2.500 passeggeri al giorno.
Maggiore è la distanza dal comune che offre simultaneamente questi tre servizi, maggiore è la connotazione periferica del comune in esame

2

INVECCHIAMENTO

Il peso degli over 80

Nel 19,8% dei comuni italiani (1565 su 7904) gli anziani con più di ottanta anni segnano una forte presenza, tra un decimo ed un terzo dell'intera popolazione. La Regione con il più alto numero di comuni con forte presenza anziana è il Molise (51,5%, 70 comuni su 136), seguita dalla Liguria (50,4%, 118 comuni su 234) e dall'Abruzzo (40%, 122 comuni su 305).
All'opposto, in Trentino-Alto Adige/Südtirol ed in Veneto il numero di comuni con una forte presenza anziana non superano il 5% (sono infatti solo l'1,4% in Trentino ed il 4,1% in Veneto).
In Trentino-Alto Adige in particolare, quasi la metà di comuni sono caratterizzati da una struttura molto più giovane del collettivo nazionale. Il 48.9% dei comuni trentini e altoatesini, 138 comuni su 282, segnano infatti una presenza di ultraottantenni inferiore al 6,4%.

Fig. I.4.4.4 | Press Review Chamber of Deputies, March 17, 2024 (curated by Data Stampa)

Fig. I.4.4.5 | Santa Fiora, the first smart working village in Italy © Dove Viaggi - Corriere, 2020

Aree tutelate nell'Appennino e nel resto d'Italia

	Appennino		Resto d'Italia	Totale Italia
Parchi Nazionali	12 parchi	48%	13 parchi	25
Parchi Regionali	36 parchi	26,8%	108 parchi	134
Rete Natura	993 siti	38,2%	1.603 siti	2.596

Fig. I.4.4.6 | Italy's Apennines and Parks; ©Data Stampa, 2023

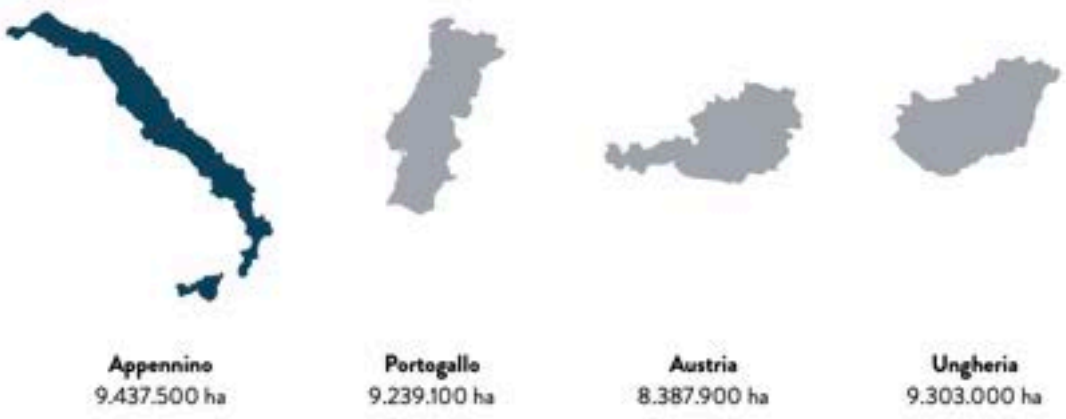


Fig. I.4.4.7 | The Italian Apennines, geography and distinction; ©Data Stampa, 2023

I.5 European regulatory framework

The promotion and development of *Smart Villages* represents a priority of significance not only at the Italian level but also at the European and extra-European levels. The importance of these initiatives is emphasized by their connection to the European *Green Deal*, which, with its ambition for climate neutrality and ecological transition, offers a unique opportunity for territorial development (European Commission Communication, 2021).

The European *Green Deal* offers an ambitious and cross-cutting framework, which can be synergistically integrated with the development of *Smart Villages*. Key sectors such as energy efficiency, renewable energy sources, the circular economy, sustainable mobility, and sustainable agriculture represent areas where innovation can significantly contribute to the goals of the *Green Deal*.

Funded projects such as *Smart Rural Communities*, *RURBAN*+, and *REScoop* illustrate the concrete commitment to the development of smart and sustainable communities in Europe. Integrating the *Green Deal* into the strategies and funding plans for *Smart Villages* is crucial to ensure a transition to a sustainable and resilient future in rural European areas (European Network for Rural Development, 2021).

At the European level, the European Commission has implemented several initiatives and funding programs, such as the European Strategy for *Smart Communities*, the Horizon Europe Program, the European Regional Development Fund (ERDF), and the European Agricultural Fund for Rural Development (EAFRD). These tools provide the necessary financial support to encourage the development of *Smart Villages* in a broader European context.

In particular, the European Strategy for *Smart Communities*, which aims to help communities become smarter and more resilient through the use of digital technologies; the Horizon Europe Program, which funds research and innovation projects in fields such as artificial intelligence, robotics, sustainable mobility, and other key sectors for *Smart Villages* development; the *ERDF - European Regional Development Fund*, which funds economic and social development projects in rural areas, including those related to *Smart Villages* development; and the *EAFRD - European Agricultural Fund for Rural Development*, which funds sustainable rural development projects, including those related to *Smart Villages* development.

In Italy, the PNRR (National Rehabilitationand Resilience Plan), the PSRN (National Rural Development Program), and the 2023 Budget Law are just some of the key tools in funding projects related to digitalisation, sustainability, and participation in Italian rural areas. The development of *Smart Villages* represents a priority at both the European and Italian levels. Since the case study analyzed concerns an enclave within the European Union, all European strategies and regulations will be addressed and analyzed, excluding other policies adopted outside the EU. The European Union has long recognized the potential of *Smart Villages* to promote economic growth, social cohesion, and environmental sustainability in rural areas. In line with this goal, the European Commission[1] has adopted a series of ini-

[1] Official website of the European Commission: https://commission.europa.eu/index_it

tiatives and funding programs to support the development of smaller territories.

These initiatives and funding programs are contributing to creating an ecosystem conducive to the development of *Smart Villages* in Europe. Thanks to these interventions, an increasing number of rural villages are adopting innovative solutions to improve the quality of life for their residents, promote economic growth, and protect the environment. They represent a truly important opportunity for rural areas in Europe because, through the use of digital technologies, they can improve the quality of life for residents, promote economic growth, and protect the environment. More and more European rural villages are becoming *smart*, and this trend is expected to continue growing in the coming years.

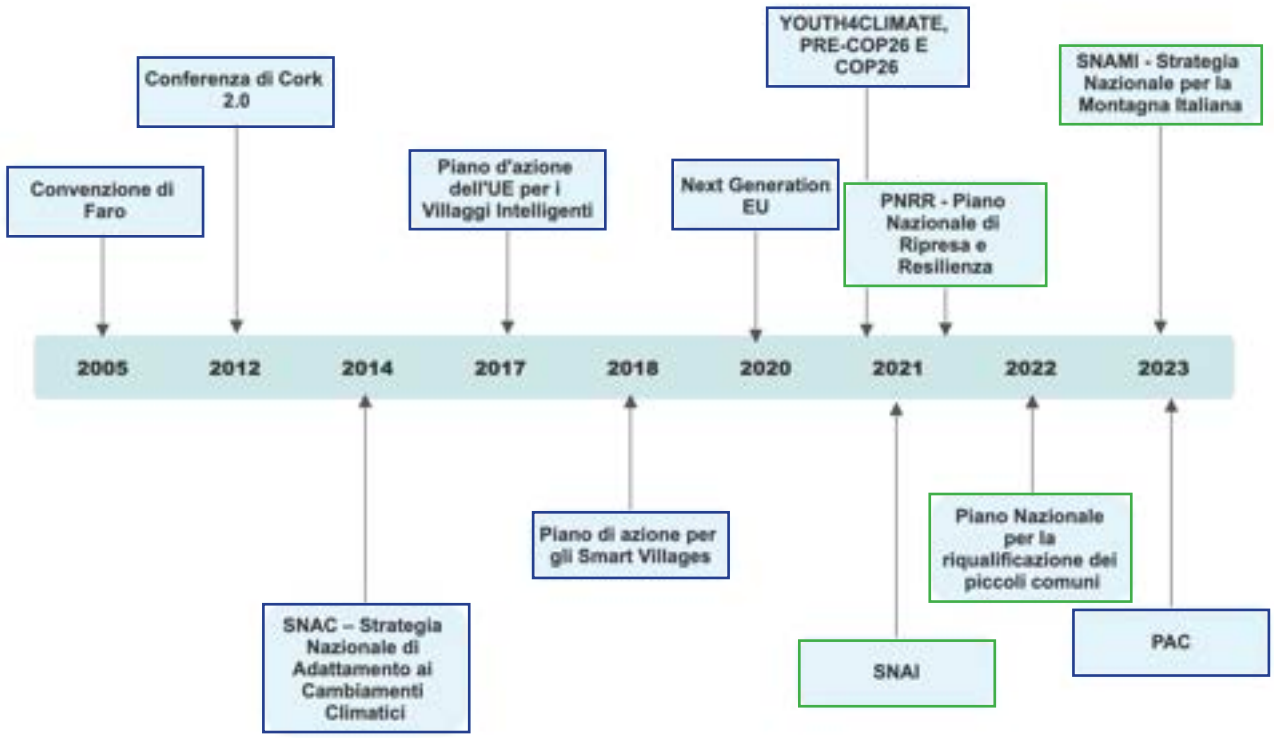


Fig. I.5.1 | Timeline of reference legislation. ©Luisa Lombardo, 2023.

The timeline presents the development of European and Italian strategies for rural areas from 2005 to the present, highlighting key moments and crucial milestones in the evolution of agricultural and rural policies. It starts with the first initiatives related to sustainability and the strengthening of local economies, followed by the introduction of policies focused on digitalisation and innovation in rural areas. The main instruments and programs of the Common Agricultural Policy (CAP) and European policies that encouraged the transition to a more inclusive and sustainable development model are examined. At the Italian level, the regulatory developments and specific initiatives for inner areas are shown, with an emphasis on the integration of local resources, the creation of smart villages, and the promotion of social and territorial cohesion. The timeline highlights how these interventions have gradually led to the creation of integrated strategies that address the modern challenges of rural areas, seeking to reconcile tradition with new technological and environmental needs. Each phase reflects an adaptation of policies to ensure a more resilient and prosperous future for rural areas, with a focus on innovation, sustainability, and inclusive growth.

I.5.1 The Faro Convention

The Faro Convention, also known as STCE No. 199, is a crucial agreement that outlines and emphasizes key elements related to cultural heritage, especially in relation to human rights and democracy. It aims to promote a more inclusive vision of cultural heritage and its relationship with communities and society. Particularly significant is its reference to places of interest, which should be appreciated for the meanings and uses people attribute to them, as well as for the values they represent. Defined as a "framework convention," it outlines relevant themes, general objectives, and potential areas of intervention for member states. These states have the discretion to identify the most suitable means for its implementation, referring to their legal, institutional frameworks and specific experiences; it does not impose specific action obligations but suggests guiding principles.

Adopted by the Committee of Ministers of the Council of Europe on October 13, 2005, and open for signature by member states in Faro, Portugal, on October 27 of the same year, the Convention entered into force on June 1, 2011. Currently, twenty-five Council of Europe member states have ratified the Convention, while four states have signed it. The Convention is named after the Portuguese city of Faro, the venue for the inaugural event for the signature of Council of Europe member states on October 27, 2005. Italy's accession, which took place on February 27, 2013, in Strasbourg, brought the number of signatory states to 21, out of 47 Council of Europe members, with 14 of them having ratified the Convention's principles. As the latest of the international cultural conventions, it is based on the premise that the knowledge and use of cultural heritage are individual rights recognized in the Universal Declaration of Human Rights[1] (Paris, 1948) and protected by the International Covenant on Economic, Social and Cultural Rights[2] (Paris, 1966). This approach enables individuals to freely participate in the cultural life of the community and enjoy the arts.

The Convention integrates with existing international instruments, inviting populations to play an active role in recognizing the values of cultural heritage and encouraging states to promote a participatory valorization process involving public institutions, private citizens, and associations. It aims to harmonize European valorization policies, considering ongoing processes of democratization of culture and open government. It recognizes that the active participation of citizens and communities is key to increasing awareness of the value of cultural heritage in Europe and its contribution to well-being and quality of life. It represents one of the approaches to cultural heritage that aligns with the concept of *Smart Villages*.

The choice of Fontecchio as the venue for the first research-action workshop on the Faro Convention, a small village with about 400 inhabitants located in the Aterno Valley in Abruzzo, is not incidental. In 2013, Fontecchio became the first small Italian municipality to adhere to the principles of the Convention, highlighting a deeply rooted sensitivity within the community towards its cultural heritage, both tangible, intangible, and natural. During the 2009 L'Aquila earthquake, Fontecchio had already demonstrated a strong awareness of the importance of cultural heritage and the artistic and architectural assets connected to it, which were considered by the community as strategic and essential elements for passing on memory to future generations. Immediately after the tragic event, the "Borghi Attivi" project was launched, promoting a deliberative democracy process to outline guidelines for local development and the village's aesthetics, also aiming to involve private citizens with the main goal of providing housing with good or excellent quality standards at subsidized rents. From these guidelines, the "Casa&Bottega" initiative emerged, a collective tool to defend employment and the landscape, supporting social housing and urban regeneration.

[1] The Universal Declaration of Human Rights, also known as the Universal Declaration of Human Rights, is a document on human rights, adopted by the United Nations General Assembly at its third session on December 10, 1948, in Paris with resolution 219077A.

[2] The International Covenant on Economic, Social and Cultural Rights is a United Nations treaty, born from the experience of the Universal Declaration of Human Rights, drafted by the Economic and Social Council of the United Nations, adopted in 1966, and entered into force on January 3, 1976.

Fig. I.5.1.1 | Faro Convention. ©Ministry of Culture, 2011.

Fig. I.5.1.2 | Fontecchio; ©Anci Abruzzo.

I.5.2 The Cork 2.0 Conference

The Cork 2.0 Conference, held on September 5-6, 2012, in the city of Cork, Ireland, was an important event promoted by the European Commission in close collaboration with the Irish government. This conference brought together over 300 participants from all EU member states and various countries around the world, with the aim of addressing rural development issues in Europe.

It marked a crucial milestone in the evolution of European policies related to the development of rural regions. During the event, participants had the opportunity to engage in a thorough debate on the challenges and opportunities facing Europe's rural areas and, at the same time, develop strategies and solutions to successfully address them.

A significant outcome of the Cork 2.0 Conference was the adoption of a new document updating the 1996 Cork Declaration. This document placed particular emphasis on the crucial role of rural areas in Europe's sustainable development, while identifying a series of goals and priorities essential for future rural development initiatives.

Among the key objectives outlined by the Cork 2.0 Declaration were the enhancement of quality of life in rural regions, with particular attention to the provision of essential services and access to educational and training opportunities; the promotion of economic growth and employment within rural communities, recognizing their undeniable potential for innovation and entrepreneurship; and the preservation of the environment and natural resources in rural areas through the encouragement of sustainable farming practices and the implementation of measures to protect the land (Cork Declaration, 2016).

At the same time, the Cork 2.0 Conference marked the beginning of the European Union's rural development program for the 2014-2020 period, with a financial allocation of over 100 billion euros to support projects aimed at rural development.

The legacy of the Cork 2.0 Conference is still tangible today, with numerous EU member states having implemented a series of projects and policies to promote sustainable rural development. The conference strengthened the central role of rural regions within the European context and laid out a clear vision for the sustainable development of rural communities in Europe. The influence of this event endures, having a lasting impact on rural development across continental Europe.

[1] The European Conference on Rural Development Cork 2.0, held in Cork (Ireland) on September 5-6, 2016, brought together over 340 rural development *stakeholders* to reflect on the challenges and opportunities currently facing rural areas in Europe and the best ways to respond to them. The primary objective and main outcome of this significant event is the "Cork 2.0 Declaration 2016: A Better Life in Rural Areas," which established the future framework for rural development policy and interventions in Europe. The Cork 2.0 Declaration draws inspiration from the multitude of messages and ideas that emerged in the participatory workshops organized during the Conference, including the views expressed by a wide range of rural development *stakeholders*: farmers and foresters, environmentalists, researchers, managing authorities of RDPs, NGOs, business operators, Local Action Groups, consultants, National Rural Networks, members of the European Parliament, auditors, and officials from the European Commission. The Cork 2.0 Declaration marks exactly twenty years since the groundbreaking European Conference on Rural Development held in Cork in 1996, which led to the signing of the first Cork Declaration, thereby laying the foundations for the EU's rural development policy.

Fig. I.5.2.1 | The Cork 2.0 Conference; ©ISPI, 2024.

I.5.3 EU Action Plan for *Smart Villages*

On April 11, 2017, the European Commission presented the EU Action Plan for *Smart Villages*, which incorporates some conclusions from the 2016 Cork 2.0 Conference on "A Better Life in Rural Areas." This plan is based on the potential and development of new opportunities through technological innovation and environmental sustainability. The goal of the European Action Plan (Simonato, 2019) is to promote sustainability and improve the quality of life in rural and mountainous areas. To achieve this, it aims to coordinate initiatives related to European policies such as rural development, regional development, research, transport, energy, and digitalisation. Specifically, its three main objectives are:

- **digitalisation and connectivity:** Promote the adoption of digital technologies and improve connectivity in rural areas, facilitating access to advanced digital services and opportunities;
- **sustainability and green transition:** Foster the transition to a sustainable economy by promoting efficient resource management, the use of renewable energy, environmental protection, and the adoption of sustainable agricultural practices;
- **social inclusion and quality of life:** Promote social inclusion, improve the quality of life in rural areas, and ensure access to essential services for all, such as education, healthcare, transportation, and culture.

The areas of focus of the Action Plan include:

- **digital connectivity:** The Action Plan commits to ensuring universal access to high-quality digital connectivity for all rural areas;
- **technological innovation:** Technological innovation is encouraged in rural areas, with particular attention to sectors such as agriculture, energy, transport, and social services;
- **environmental sustainability:** The Action Plan promotes environmental sustainability in rural areas through the adoption of digital technologies aimed at reducing environmental impact;
- **local community participation:** Actively supports the participation of local communities in the development process of *Smart Villages*;
- **cooperation among stakeholders:** The Action Plan encourages collaboration between public and private entities for the progress of *Smart Villages*.

The funding for the Action Plan was supported by an investment of 100 million euros within the framework of the European Union's Rural Development Program for the 2014-2020 period. Additionally, the European Commission launched a series of initiatives aimed at promoting the development of *smart villages*, including the "*Smart Villages*" portal. Tangible examples of how digital technologies can improve rural areas include:

- **precision agriculture:** The use of artificial intelligence technologies to optimize the use of agricultural resources, increasing productivity and reducing environmental impact;
- **renewable energy:** The management and monitoring of renewable energy resources through digital technologies to improve efficiency and accessibility;
- **sustainable mobility:** Improvement of public and private transport services in rural areas through the use of digital technologies to facilitate movement;
- **social services:** Provision of healthcare, educational, and social assistance services remotely using digital technologies, increasing accessibility for residents of rural areas.

It represents a significant initiative for the progress of rural areas in Europe. It offers a wide range of resources and tools aimed at enhancing the use of digital technologies to improve the quality of life, foster economic growth, and preserve the environment within rural villages. Since these rural areas have specific needs and potentials, and lack standardized models or solutions, a development approach centered on territorial capital has been cho-

sen. This refers to the set of social, environmental, economic, cultural, and institutional resources that characterize places.

Thus, *"smart"* villages are born, which are communities made up of citizens who, through active participation, find concrete solutions to daily challenges, interpreting in innovative ways the dynamics that are transforming rural areas.

The concept of *"smart"* is closely related to the idea of *"smart"* in terms of using digital technologies to promote social innovation, raise awareness of renewable energy and emerging bioeconomy, meet the growing demand for typical and healthy products, adopt circular economy principles, and promote ecotourism. Additionally, the creation of new forms of cooperation and alliances between the agricultural sector and various components of rural society, between municipalities, private entities, and civil society, is encouraged.

Numerous *smart village* projects have already been launched. EU initiatives aim to provide data, *best practices*, networks, funding, and regulations to support these experiences (European Commission, 2021). Some of these initiatives include:

- The *SIMRA Project* - Social Innovation in Marginalized Rural Areas, funded by the Horizon 2020 research and innovation program, defines a database for social innovation in the rural areas of the Mediterranean Basin, identifying *best practices* and their application in a pilot context;
- the *SMARTA Project* - Rethinking Rural Mobility, from the European Parliament, which proposes innovative solutions for rural mobility;
- the TESS Project - Transactional Environmental Support System, funded by the EU's 7th Framework Programme, which gathers 63 climate initiatives implemented by different communities across Europe, highlighting the climate change mitigation potential and social cohesion resulting from collaboration;
- the *RURITAGE Project*, coordinated by the University of Bologna, to promote local cultural and natural heritage as a catalyst for sustainable development, with six innovation areas to transform rural areas into sustainable development labs/demonstrators;
- the integrated RurAction research and doctoral program, funded by the European Union under the Marie Sklodowska-Curie Horizon 2020 Innovative Training Network actions;
- the Alpine Macroregional Strategy, officially *EUSALP* (EU Strategy for the Alpine Region), an agreement signed in 2013 by EU countries: Italy, France, Germany, Austria, Slovenia, and two non-EU countries, Switzerland and Liechtenstein, to promote the sustainable management of energy, natural and cultural resources, and environmental protection of the territory, aiming to enhance the development of the Alpine area;
- *RUMRA & Smart Villages*, the Intergroup on rural, mountain, and remote areas (2014-2019), promoting integrated development for European territories in their diversity, supporting new forms of *governance* and cooperation, place-based initiatives, and the use of technology, with the goal of strengthening integration and ensuring a sustainable future for all Europeans;
- the *SOCLIMPACT Project*, which aims to mitigate the effects of climate change and their socio-economic impact on European islands from 2030 to 2100 in the context of the Blue Economy, exploring and evaluating the impact of potential decarbonization pathways;
- *COASTAL*, with the aim of promoting multi-actor collaboration among coastal and rural *stakeholders*, formulating and evaluating business solutions and policy recommendations to improve the cultural, social, and economic development of islands;
- *DESIRA* (Digitisation: Economic and Social Impacts in Rural Areas), a Horizon 2020 project (2019-2023) coordinated by the University of Pisa, involving 25 partner organizations (research entities, NGOs, and

SMEs) in a multi-actor and interdisciplinary approach. The project aims to enhance society's and policymakers' ability to respond to the challenges posed by digitalisation in agriculture, forestry, and rural areas;

- the *dRURAL Project*, which develops and implements a digital solution offering multiple services to rural citizens, creating opportunities, economic growth, and improvements in quality of life, funded by Horizon 2020;
- *RUBIZMO*, a 42-month project funded by the EU's Horizon 2020 research and innovation program, launched in May 2018, aiming to discover the vital ingredients for the development of entrepreneurship and successful business models in high-potential sectors such as food and agriculture, new bio-based value chains, and ecosystem services.

The EU Action Plan for *Smart Villages* represents a significant historical moment, introducing, for the first time, the theme of artificial intelligence and, therefore, the concept of "*smart*", as well as an operational tool to promote innovation, sustainability, and inclusion in rural areas. Through its guidelines and initiatives, the plan aims to transform rural communities by improving access to technology, promoting environmental sustainability, and fostering social inclusion. Successfully implementing the Action Plan requires ongoing commitment from European institutions, national governments, and local communities to build modern, sustainable, and prosperous *Smart Villages*.

Fig. I.5.3.1 | Italy: Meeting on Cultural Routes in the Alpine Region (Routes4U, EUSALP) - Cultural Routes. ©European Council, 2019.

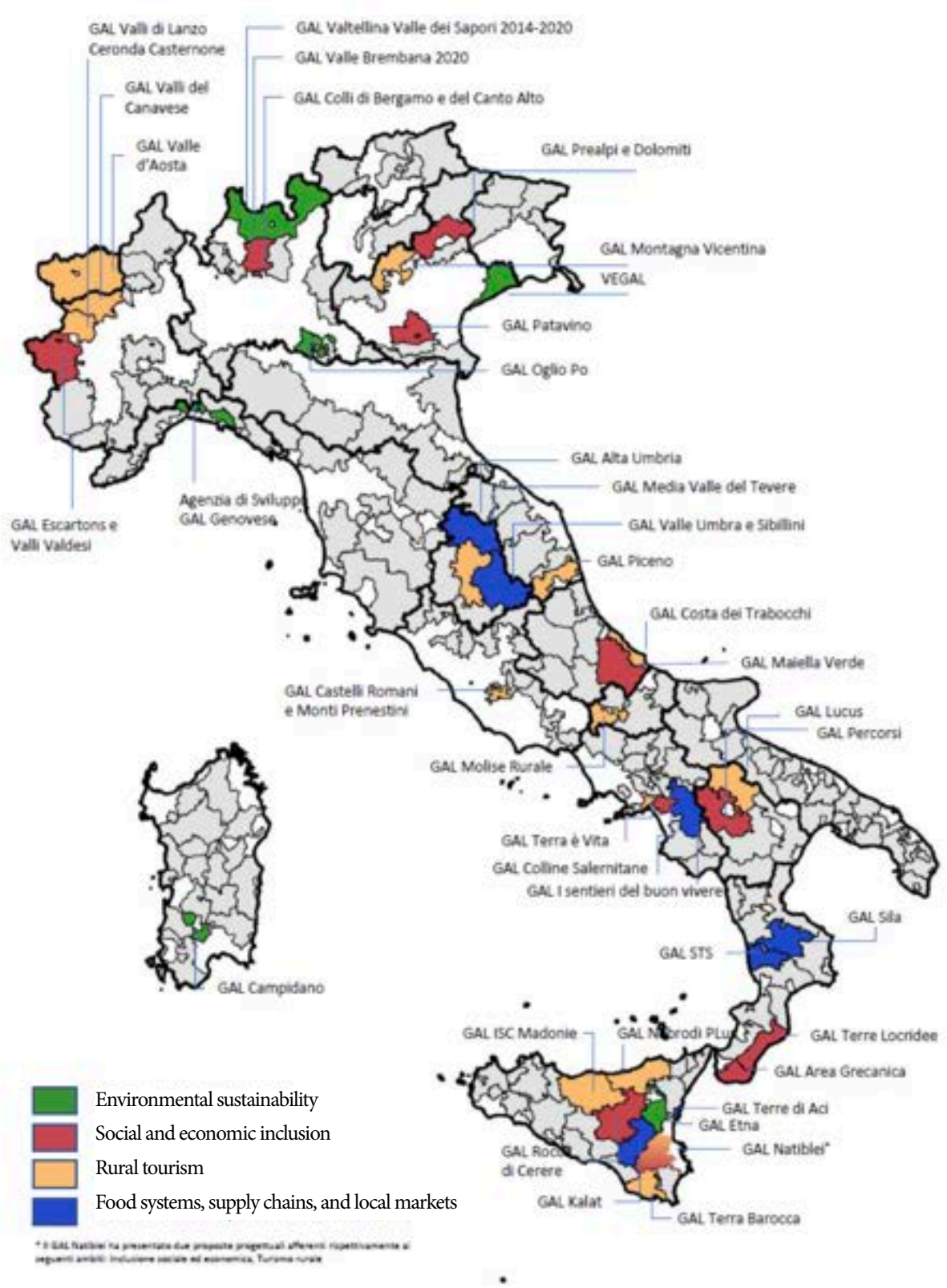


Fig. I.5.3.2 | Map of the Local Action Groups (LAGs) participating in the Call for predominant thematic area Smart Villages Action Plan ©CreaBP, 2021.

The image illustrates the network of Local Action Groups (LAGs) in Italy, which play a key role in promoting rural development through the management of European Rural Development Funds (PSR). Each LAG is a territorial organization that brings together various local actors, including public authorities, private entities, and associations, with the goal of designing and implementing integrated development strategies to improve local economies, enhance natural and cultural resources, and strengthen social cohesion. The image highlights the geographic distribution of the LAGs in Italy, their intervention sectors, and the main initiatives developed to support economic growth and sustainability in rural areas, with particular focus on promoting innovative and inclusive practices.

I.5.4 The *Smart Villages* Action Plan

[1] Ursula von der Leyen, President of the European Commission, states: "*Smart villages can be the key to a more resilient, inclusive, and prosperous rural future.*"

On May 22, 2018, in Brussels, the European Rural Network presented the action plan for *Smart Villages*, with a strategy based on 16 initiatives to support and improve the implementation of EU policies aimed at rural areas. The goal is to reflect on the villages of the future, announcing a series of initiatives within the framework of EU policies and funds related to rural development, regional development, research, transportation, energy, and digitalisation.

The action plan includes 16 initiatives, including conferences, seminars, and pilot projects, ongoing or scheduled until 2020. These are measures already activated and funded across various intervention lines, aimed at improving the implementation of EU policies for rural areas and new initiatives directly linked to *Smart Villages* (Leuba, 2017).

The European Rural Development Network (RESR) has highlighted that for many European citizens, rural areas are a place to live, work, and raise a family. The EU's actions align with this vision and exemplify how the existence of common institutions makes it possible to spread good practices to address similar challenges, with institutional incentives toward multi-level *governance*. Such *governance* strives to create convergence among the many tools available to different institutions (local, regional, national, European), ensuring a balance between the need for uniformity in rights and duties and the recognition of the diversities present in communities and territories.

The goal of the involved Directorates-General is to identify drivers and success factors for *smart villages*, that is, rural communities that fully leverage their resources, enhancing traditional ones and, most importantly, activating new ones through digital technologies, communication, and innovation to create opportunities and attractiveness for rural areas. The project's outcome should lead to identifying solutions applicable across the European Union (Nieto et al., 2019), considering the diversity of different contexts. Sharing a common definition and characteristics of eco-social and *smart villages*, with concrete examples of good practices, should be an important tool to contribute to improving rural development. The involvement of all citizens supported by effective *governance* will ensure success.

There are numerous European policies contributing to the realization of this project, including rural development policies, cohesion policies, and calls under programs like Horizon 2020 and Connecting Europe Facility, through a vision of collaboration and integration of available EU funds. However, it is primarily the European Agricultural Fund for Rural Development (EAFRD) (also with LAEDER and PEI) that plays a central role, providing numerous support tools for *smart villages*. Nearly 100 billion euros from the EU budget have been allocated for a total of 118 rural development projects for programs in the period 2014-2020. These investments primarily concern the environment, climate, and transport sectors.
These are the 16 initiatives of the Action Plan:

1. TWG "Smart Rural Enterprises" - European Rural Network - 2016-2017;
2. TWG "*Smart Villages*" - European Rural Network - second half of 2017;
3. Workshop on access to data and digital platforms - PEI - April 2017;
4. Seminars on developing new projects through the use of technologies - PEI - June 2017;
5. Conference on innovation in agriculture and rural development - Portugal and DG AGRI - October 2017;
6. Call for pilot projects on Smart Eco Villages - DG AGRI - 2017-2018;
7. LEADER/CLLD - Member States - 2014-2020;
8. Smart specialization on agri-food (S3P Agri-Food) - DG REGIO, AGRI, JRC, RTD - 2014-2020;
9. Broadband Competence Network (BCO) - DG AGRI, REGIO, CNECT - 2016-2020;

10. Digital *Innovation Hubs* (DIH) - DG CNECT and RTD - 2014-2020;
11. SMARTA - DG MOVE - since 2016;
12. Internet of Things (*IoT*) - Horizon 2020 - DG AGRI and CNECT - 2017-2020;
13. More efficient and smarter door-to-door logistics - Horizon 2020 - DG MOVE - 2016-2017;
14. Business models for a modern rural economy - Horizon 2020 - DG AGRI - 2016/2017;
15. Future calls under "rural renaissance" - Horizon 2020 - DG AGRI - 2018-2020;
16. Information-based bioeconomy - Horizon 2020 - DG CNECT - 2017-2019.

In the last two years, the European Rural Development Network (RESR) has carried out various activities to examine the first of these two challenges, organizing thematic groups on value chains and businesses and their smart competitiveness. The group aims to become a reference point for sharing experiences and promoting new ways of implementing rural development policy (Wolski et al., 2019).

The main objectives are therefore: to develop recommendations and examples to improve strategies for revitalizing innovative rural services and strengthening the role of RDPs, to provide guidance, tools, and examples at the level of concrete projects. All *feedback* from these activities will then be disseminated through the rural development network.

In the Italian context, many small municipalities and rural villages are capable of embarking on the *Smart Village* path and can serve as examples of sustainability and opportunity. The National Strategy for Inner Areas, which we will discuss later, focuses on these rural realities to guide them, leveraging their strengths, consolidating them, and creating new ones to offer new development opportunities (Visvizi et al., 2019).

Fig. I.5.4.1 | The European Observatory of Smart Villages © National Rural Network 2014 - 2020, 2023.

I.5.5 Next Generation EU

In recent years, the European Union has gone through a period of repeated financial crises and recessions. Income and employment inequalities between member states and across geographic areas have increased, exacerbating social tensions and political risks. In 2020, the health emergency caused by the Covid-19 pandemic led to an unprecedented production shutdown and the adoption of emergency measures with profound social consequences. During the Covid-19 epidemic, the awareness of common fragility was accompanied by the urgency for a turning point. Europeans approved tools aimed at addressing the crisis and laying the foundations for rehabilitation.

The real historic turning point came with the agreement to finance the *Next Generation EU*[1] (NGEU) initiative with €750 billion. All institutions were involved in a coordinated and consistent action for this new course. Already in the first half of 2020, the European Central Bank (ECB) continued and strengthened its monetary expansion. The Commission approved the flexible use of budget resources through the Coronavirus Response Investment Initiative (CRII plus), the general safeguard clause of the Stability and Growth Pact, and the temporary framework for state aid rules. Even before NGEU, unprecedented safety nets were made available to address the social, economic, and health emergency: SURE, the recapitalization of the EIB, as well as a new specific line of credit to tackle the pandemic within the European Stability Mechanism (ESM), approved in spring and available to Euro Area member states (European Commission, 2021).

Finally, at the end of December 2020, the Council of the European Union and the European Parliament reached an agreement on the new Multiannual Financial Framework for 2021-2027, overcoming vetoes in an effort of solidarity and making all available resources operational for the Union's recovery.

Next Generation EU (European Commission, 2021) addresses a historic need, the creation of new intra-European and Mediterranean networks, and the launch of collaborative infrastructures for science and research, starting with the challenge of global health.

It expresses the urgency and opportunity of a true European economic Renaissance, with an instrument that will allow the Commission to raise funds on the capital markets. It signals the sharing of a common course. A cultural challenge that involves all territories. A transformation process toward *green* and digital transition, enabling the European Union to regain ground in the global technological race, create quality jobs while maintaining and renewing the European social model, and establish global leadership for sustainable development, all the more necessary after the Paris Climate Agreements.

Italy has been strongly committed to this European turning point. Today, it is on a path of progressively shared risks for investments aimed at addressing common priorities, recovering production capacity, improving both material and immaterial infrastructure, and tackling the energy and digital transitions. The challenge of inclusive growth concerns all of Europe, which must find a new role in technological competition and the reorganization of value chains. But it particularly concerns Italy, where previous crises have exacerbated significant gender, generational, and territorial inequalities, deeply undermining rehabilitationcapacities.

Italy intends to be a key player in this European Renaissance through the revitalization of public and private investments, alongside reforms aimed at strengthening the capacity and efficiency of institutions through the National Rehabilitationand Resilience Plan, which will be addressed in the following sections. This plan is focused on programming and implementing investments that mark a decisive break for sustainable development, digitalisation, and innovation, as well as reducing disparities and inequalities, particularly between rural areas and *Smart Cities*. The tool is designed to shape a more sustainable and inclusive Italy, equipped with an advanced and dynamic economy.

[1] A temporary initiative for economic and social rehabilitation from the immediate damage caused by the coronavirus pandemic, with a budget of over 800 billion euros, aimed at creating a greener, digital, and more resilient Europe capable of facing current and future challenges.

Fig. I.5.5.1 | Next Generation EU ©European Commission, 2022.

As a recovery-oriented initiative, the Plan aims to address the economic and social impact of the pandemic crisis, drawing on lessons learned during some of the most difficult periods in Italy's republican history. Rehabilitationmust shape a new Italy, leveraging the opportunities offered by the ecological and digital transitions. The goal is to unleash the growth potential of the economy, increase productivity, generate new employment, and improve the quality of work and public services, starting with healthcare and education. This resilience work involves preparing the state, businesses, and all social actors to face such events, adapting to the changes brought by globalization and new technological frontiers. Furthermore, it assumes a reformist character, as the investment lines are accompanied by the adoption of a reform strategy in line with the European Commission's Recommendations and National Reform Plans. The implementation of reforms is an integral part of the Plan.

The revitalization action outlined in the Plan is guided by policy objectives and interventions linked to the three European strategic pillars:

- digitalisation and innovation;
- ecological transition;
- social inclusion.

These priorities play a crucial role for Italy, addressing critical issues such as the low propensity for innovation and the low level of digitalisation, which contribute to weak economic growth rates and insufficient employment. The Plan allows Italy to become a key player in the European Green Deal, reducing pollutant emissions, creating jobs in the *green* economy, improving energy efficiency, and promoting industrial processes related to the *green* transition. The challenge of sustainability and emission reduction will also be addressed through digital solutions.

In the next decade, rapid digital transformation will be central to geopolitical competition and will characterize the industrial supply chains of Italian manufacturing and all aspects of social life. Digital technology will be the enabling platform for reforms and competitiveness. Extensive investment in digital infrastructure, skills, and culture will unlock the potential of all Italian territories.

For Italy to be truly sustainable, it is necessary to address and reduce gender, generational, and territorial inequalities. Therefore, implementing the interventions connected to the Plan becomes essential to tackle and resolve issues related to three cross-cutting priorities: women, youth, and the South, which are crucial to activate the development potential and rethink social infrastructure and the public sector. The main mission is to align and govern the growth drivers of the next decade by involving all citizens and economic and social entities in a collective national effort, addressing the structural issues that have hindered Italian development for too long.

Fig. I.5.5.2 | Next Generation EU ©FIRST, 2022.

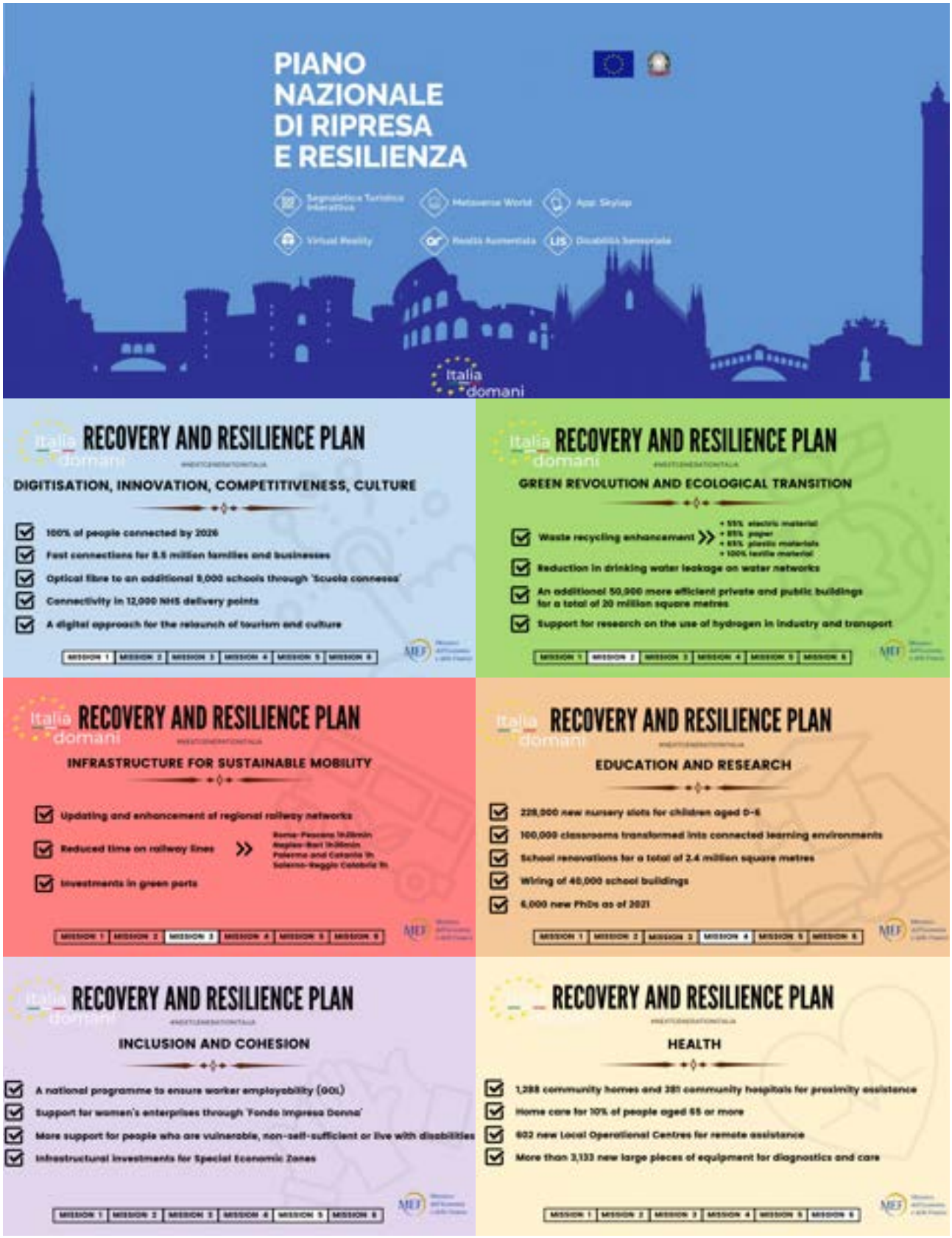


Fig. I.5.5.3 | 6 priority of the Next Generation EU ©Ministero delle Economie e delle Finanze, 2022.

The image presents Italy's National Rehabilitationand Resilience Plan (PNRR), a strategic program funded by the European Union to support the country's economic rehabilitation and resilience following the COVID-19 pandemic. The plan is structured into six main missions, each focusing on specific areas of intervention: Digitalisation, innovation, and competitiveness of the production system; Ecological transition; Infrastructure for sustainable mobility; Education and research; Inclusion and social cohesion; and Health and well-being. The image illustrates the priorities of each mission, highlighting the sustainable development goals and promoting a greener, more digital, and inclusive Italy. The PNRR aims to reduce inequalities, promote technological innovation, and ensure fair and lasting economic growth, with a particular focus on the country's less developed areas, including rural zones.

I.5.6 Youth4Climate, Pre-COP26 and COP26

Between September 28 and October 2, 2021, the Youth4Climate initiative took place, globally recognized in 2002 thanks to the collaboration between the Ministry of Environment and Energy Security and the United Nations Development Programme. This significant event involved young climate leaders in preparation for Pre-COP26. Aware of the urgent need to address climate change, they shared solutions and actively participated in the debate to positively influence the agenda. It is important to highlight that the initiative not only focused on global climate issues but also on the importance of extending its impact to Europe's inner areas (Ministry of Environment and Energy Security, 2021).

The event was promoted by the Italian Ministry for Ecological Transition[1], in collaboration with Connect4Climate[2] of the World Bank Group, with the participation of the Lombardy Region and the Municipality of Milan, as well as the active support of FAI - Fondo Ambiente Italiano[3] volunteers, Santagata Foundation, Italia Nostra, and AIGU - Associazione Italiana Giovani per l'UNESCO. The initiative brought together young global citizens to examine territorial issues, including both cities and more or less peripheral centers, such as rural and remote areas in Italy.

The discussions among the young leaders focused on four specific topics: the role of civil societies in adapting to climate change, the importance of ecological transition in cultural heritage, actions for safeguarding, emergency response, and prevention of fragile cultural heritage, and the use of computerized systems to understand risks related to cultural heritage. This meeting facilitated a fruitful exchange of ideas between experts and participants, culminating in the drafting of a document sent to the Ministry of Cultural Heritage and Activities (MIC) to integrate it into preparatory materials for COP26. On September 30, 2021, the youth's requests were heard by President Sergio Mattarella, Prime Minister Mario Draghi, and UK Prime Minister Boris Johnson during the opening of the Pre-COP26 ministerial conference.

The Pre-COP26, which involved around 400 young delegates from various countries, was a crucial event to fuel the October Pre-COP summit. The young participants were called to develop four key pillars: Youth Driving Ambition, A Climate-Conscious Society, Sustainable Recovery, and Engagement. Finally, COP26, which concluded in Glasgow on November 13, saw significant progress, including an increase in financial commitments to support developing countries and the adoption of key initiatives such as reducing methane emissions and the development of the Paris Code. The Youth4Climate initiative and the active participation of young climate leaders represented hope and an opportunity for change, extending their contribution to Europe's inner areas. Their commitment was crucial in building a more resilient world and mitigating the effects of climate change, uniting governments, international organizations, civil society, and young leaders in building a sustainable future.

Fig. I.5.6.1 | Next Generation EU ©FIRST, 2022.

[1] It replaces the Ministry of the Environment and Protection of Land and Sea. The scope of action of the new ministry is broad, as it absorbs, in addition to all the competencies of the former Ministry of the Environment, also some key responsibilities in the process of ecological transition, mainly related to the energy sector

[2] A global partnership program of the World Bank Group dedicated to engaging a diverse audience through creative communication campaigns on climate. Its goal is to accelerate and strengthen climate action in search of a sustainable future.

[3] The FAI - Fondo per l'Ambiente Italiano ETS is an Italian non-profit foundation that operates thanks to the support of private citizens, businesses, and institutions for the protection of Italy's historical, artistic, and landscape heritage.

I.6 Italian regulatory framework

The commitment of the Italian government to the revitalization of the inner areas goes beyond mere fund allocation; it is a statement of intent aimed at renewing and revitalizing rural areas, often neglected. The PNRR emerges as a guiding beacon, offering a holistic vision that not only aims to counter depopulation but also to create conditions for sustainable economic growth and a better quality of life in the inner regions.

The funding of 1.8 billion euros allocated to the inner areas of Italy within the PNRR highlights the importance of modernizing and digitizing these regions. The installation of high-speed Wi-Fi networks is not only a step towards global connectivity but also a powerful means to encourage innovation, training, and the active participation of rural communities in the digital economy. The adoption of sustainable mobility systems, promoted through this plan, will improve connectivity between villages, while also stimulating local and sustainable tourism.

The PSRN - National Rural Development Plan, with its funding of 1.5 billion euros, is an important complement, addressing key aspects such as agricultural innovation, job creation, and tourism attraction. The creation of new agricultural enterprises represents an investment in the future of rural communities, contributing not only to food security but also to economic growth. Attention to the transformation and commercialization of agricultural products enhances the role of these areas on the national stage, promoting their unique identity and stimulating the local economy.

The 2023 Budget Law, with its additional funding of 100 million euros for *Smart Villages*, is another step forward. The installation of solar panels and photovoltaic systems in public buildings not only promotes environmental sustainability but also creates new job opportunities and reduces dependence on traditional energy sources. The promotion of sustainable mobility and the creation of training and innovation centers offer fertile ground for the development of local skills and initiatives.

Observing the European context and inner areas that have already benefited from similar funds provides a valuable perspective for Italy. The diversity of approaches and the success of such strategies show how a long-term commitment and an integrated vision are essential for the revival of inner areas.

Italy is adopting an ambitious and comprehensive strategy to ensure that its inner areas not only overcome the challenges of depopulation but become centers of innovation, sustainability, and prosperity. These investments represent an investment in the country's future, preserving and enhancing the cultural and natural heritage of the inner regions. The path taken seems to promise a future in which rural communities not only survive but thrive, actively contributing to the overall growth of Italy.

In the following paragraphs, the various initiatives aimed at supporting the development, rehabilitation, and enhancement of Italy's inner areas will be closely examined, drawing on European paradigms. First, the pillar of the National Strategy for Inner Areas (SNAI) will be examined, as it constitutes the foundation of the entire thematic context. Subsequently, the National Rehabilitationand Resilience Plan (PNRR), which in response to the pan-

demic event, has taken a central role in defining strategies for the relaunch and development of these regions.

In addition to these central programs, the analysis will cover a series of more specific interventions to promote the revitalization of the most picturesque places in our country. In this context, the National Plan for the Redevelopment of Small Municipalities will be explored, a key initiative aimed at revitalizing small communities while preserving their cultural and historical heritage. The National Strategy for Mountain Areas (SNAMI), which was born with the aim of supporting mountain territories, often disadvantaged, to ensure their economic and environmental sustainability.

The National Strategy for Climate Change Adaptation (SNAC), which aims to adopt effective strategies in response to the rapidly evolving climate challenges. Finally, the Action and Cohesion Plan (PAC) will be examined, a significant program aimed at ensuring equitable and sustainable cohesion between the country's regions and the regional initiatives undertaken for small rural communities, with a case study on the Sicilian Madonie area.

Taken together, these initiatives outline a complex but well-articulated framework of targeted interventions, all aimed at supporting the regeneration of Italy's inner areas. Through the analysis of these programs, the commitment of the Italian government to promoting sustainable development, resilience, and the enhancement of the wealth found in these fascinating regions can be fully understood.

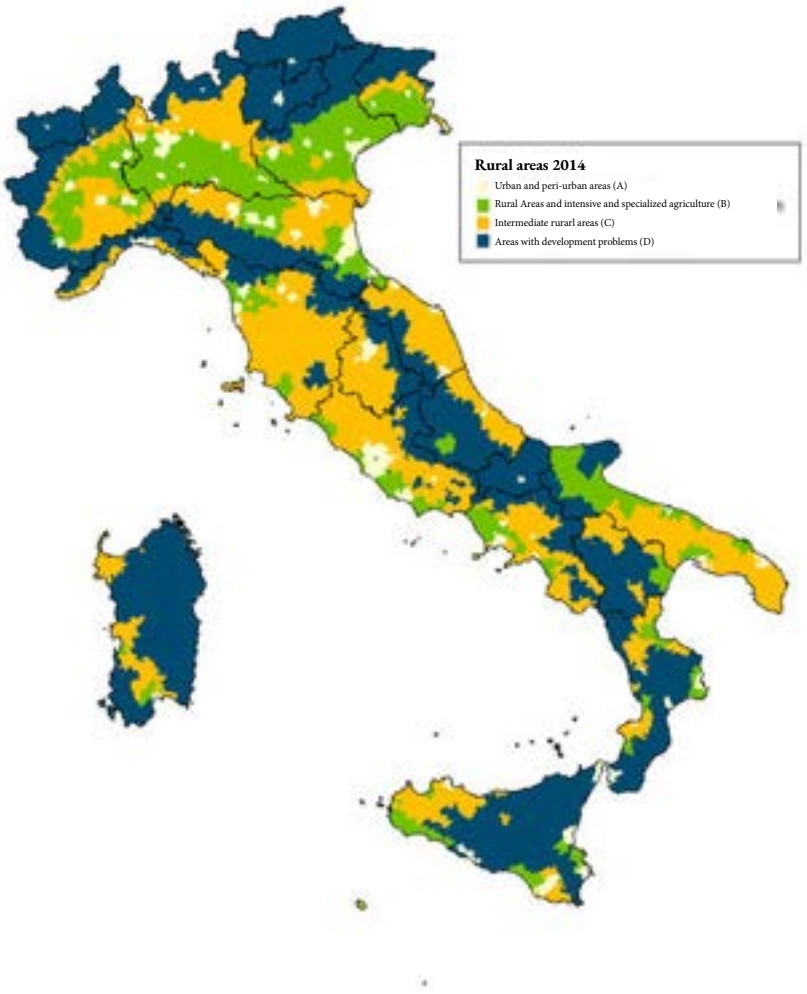


Fig. I.6.1 | A representation of rural areas in Italy divided into urban and peri-urban, intensive and specialized agriculture, intermediate rural, and rural areas with development challenges ©Rete Rurale, 2014.

I.6.1 SNAI - National Strategy for Inner Areas

The National Strategy for Inner Areas[1] (SNAI) (*Fig. 1*) is a territorial development and cohesion policy adopted at the national level, aimed at combating the phenomenon of marginalization and depopulation in the inner regions of our country. This ambitious project introduced new forms of *governance*, adopting an integrated approach at the local level, in order to promote the development of marginal areas characterized by geographical and demographic disadvantages.

The main goal of the SNAI is to address these problems and find solutions by combating demographic decline and halting the "demographic hemorrhage" that affects these areas. The SNAI selected 72 Italian areas, 1,077 municipalities, and about 2,072,718 inhabitants (*Fig. 2*). For the 2014-2020 programming period, this included 1,060 municipalities with around 2 million inhabitants (ISTAT data, 2020). These areas cover an area of about 51,000 km² and represent 13.4% of all Italian municipalities and 26% of municipalities classified as inner areas. They also constitute 3.4% of the national population and 15.5% of the population residing in municipalities classified as inner areas. They occupy 17% of the entire national territory and 28.4% of the total area of all inner areas in Italy. National resources allocated to these areas amount to over 591 million euros, in addition to funds from the European Structural and Investment Funds (SIE) and other public and private funds, in order to counter depopulation in inner areas and promote social cohesion.

The implementation actions focus on two main areas within the municipalities of the Inner Areas: essential services and local development. Regarding essential services, projects aim to improve the quality and quantity of education, healthcare, and mobility services. Local development actions, on the other hand, focus on protecting the territory and local communities, enhancing natural and cultural resources, supporting agro-food systems and local development, energy savings, and local renewable energy and craftsmanship supply chains.

The SNAI also includes a series of actions to promote collaboration among the various inner areas, including the creation of the Network of Inner Areas, a cooperation platform between the different Italian inner areas aimed at promoting the sharing of experiences and collaboration between areas, in order to strengthen their development capacities. Furthermore, a series of pilot projects have been funded to test new solutions for the development of inner areas. The Network of Inner Areas has partially contributed to collaboration between inner areas and the strengthening of their development capacities, but there is still much to be done.

[1] European Structural and Investment Funds (ESIF) represent the main instrument of the European Union's investment policy. The ESIF includes five funds: the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD), and the European Maritime and Fisheries Fund (EMFF). Italy, along with 19 other EU countries, will also benefit from the Youth Employment Initiative (YEI).

Fig. I.6.1.1 | SNAI Logo ©Agency for Territorial Cohesion, 2020.

Fig. I.6.1.2 | Photo by Stefano Intintoli on Unsplash - https://unsplash.com/photos/l4Q2mRL1o2I ©ForumPa, 2020.

Fig. I.6.1.3 | Map of the 72 Italian SNAI areas. ©Department for Cohesion Policies, 2014.

Italy's inner areas are mainly concentrated in the inner regions and along the Apennine range, predominantly distributed in the central and southern regions of the country. These areas, often marginalized compared to major urban centers, encompass mountainous and hilly territories characterized by lower population density and limited access to services. Along the Apennine chain, numerous municipalities, despite being rich in natural, cultural, and historical heritage, face challenges related to geographical isolation, mobility difficulties, and a lack of infrastructure. The inner areas of central and southern Italy include extensive regions of Calabria, Sicily, Campania, Puglia, Abruzzo, Molise, and Basilicata. These areas are significant reservoirs of local traditions and cultural identity but frequently experience population aging, a limited provision of services, and a scarcity of job opportunities. The situation is even more pronounced in ultra-peripheral zones, which are undergoing progressive depopulation and facing increasing challenges in attracting investments. However, if properly enhanced and supported by development policies, these areas can represent an opportunity for economic and social growth, thanks to their rural, natural, and cultural heritage.

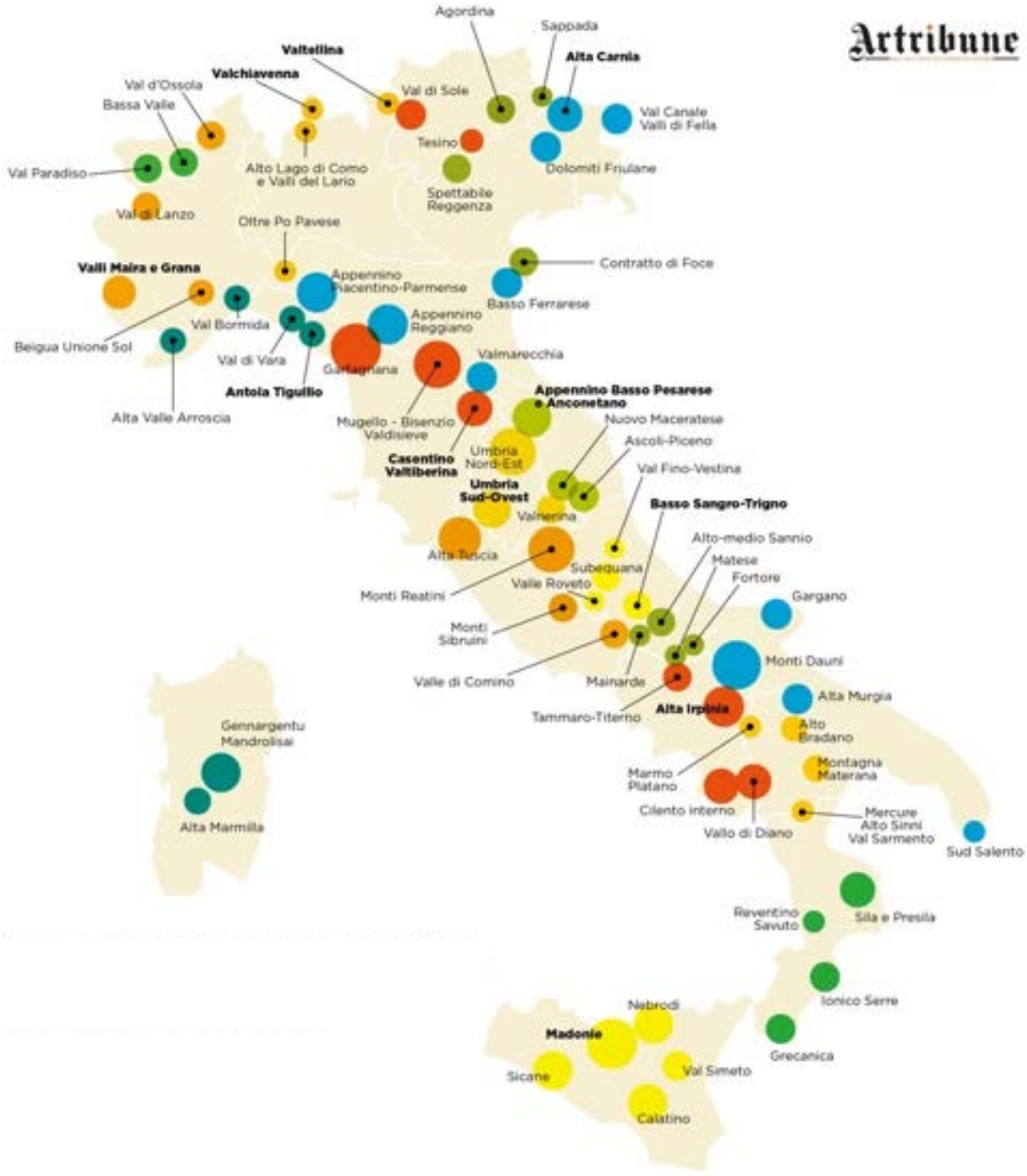


Fig. I.6.1.4 | Depopulation and Inner Areas. SNAI Data. Graphic ©Alessandro Naldi, 2020.

The map highlights the 71 areas selected within the framework of the SNAI; currently, 1,066 municipalities are involved, accounting for 16.7% of the national territory. In bold, the 11 areas that have already defined their strategies.

I.6.2 PNRR - National Rehabilitationand Resilience Plan

The pandemic struck Italy, exacerbating an economic, social, and environmental crisis already underway. Even before COVID-19, the country lagged behind other advanced European nations, grappling with productivity issues, a fragmented productive fabric, and a limited inclination to adopt new technologies, both in the private sector and in Public Administration. The Next Generation EU (NGEU), better known in Italy as the "RehabilitationFund," allocated funds to help Member States recover from the pandemic-induced crisis. To access these funds, Italy, like every other Member State, had to present its package of investments and reforms, known as the National Rehabilitationand Resilience Plan (NRRP). This plan is structured into six missions, with a budget of €191.5 billion allocated as follows:

- digitalisation, innovation, competitiveness, and culture: €40.32 billion;
- *green* revolution and ecological transition: €59.47 billion;
- infrastructure for sustainable mobility: €25.40 billion;
- education and research: €30.88 billion;
- inclusion and cohesion: €19.81 billion;
- health: €15.63 billion.

Digitalisation, Innovation, Competitiveness, and Culture: promoting digital innovation to support the country's infrastructure and the transformation of production processes in businesses, with a particular focus on Transition 4.0 and innovative projects for the Made in Italy supply chains. These projects are accompanied by a reform on industrial property aimed at defining a multi-year strategy to foster a culture of innovation and the tools for protecting and enhancing industrial property. The reform, initiated by Minister Giorgetti, allocated €30 million in resources.

Green Revolution and Ecological Transition: promoting the country's *green* transition by focusing on energy production from renewable sources, increasing resilience to climate change, supporting research and innovation, and incentivizing sustainable public transport.

Of these funds, €1.25 billion has been allocated to strengthen investments in key sectors of the ecological transition, while €1 billion has been dedicated to investments in renewable energy and batteries for the photovoltaic, wind, and battery industries. Key actions include the creation of a Gigafactory for the production of high-efficiency innovative photovoltaic panels, the construction of an industrial facility for manufacturing flexible wind energy panels, and the development of an "ultra-modern" *Gigafactory* in the battery sector.

Additionally, an investment of €250 million has been planned to support the growth of innovative *startup*s through the creation of a *Green Transition Fund* (GTF) targeting sectors such as renewable energy, the circular economy, mobility, energy efficiency, waste management, and energy storage.

Education and Research: Research and development aim to enhance interaction between businesses and public entities, improving small and medium-sized enterprises' capacity for innovation and their participation in strategic sectors critical for national and European competitiveness.

The PNRR and complementary funds provide €3.35 billion, distributed as follows:

- funding for the IPCEI Fund: €1.5 billion;
- horizon Europe: €200 million;
- funding for the National Innovation Fund: €300 million;
- refinancing and thematic extension of technology transfer centers: €350 million.

In addition, €1 billion is allocated to finance the Innovation Agreements.

Inclusion and cohesion: With a funding of €400 million, the plan also includes strengthening and launching new female entrepreneurship. Additionally, the "Fondo Impresa Donna" (Women's Business Fund) was enhanced

with the 2021 Budget Law, which allocated an initial funding of €40 million.

Approximately €66 billion are designated for investments managed by territorial authorities, with €20 billion allocated to the South, plus €9 billion from the React-EU program, €54 billion from European Structural Funds, and €58 billion from the Development and Cohesion Fund.

To support the actions of municipalities, provinces, metropolitan cities, and regions, the government has implemented a series of tools, especially for the South and local administration bodies. Specific technical figures are planned to provide assistance at various stages of program development and project implementation. The available tools include:

- **specific hires/1:** municipalities will have the opportunity to hire non-managerial personnel with a dedicated fund of €30 million per year until 2026, aimed at reducing expenses for municipalities with fewer than 5,000 inhabitants;
- **specific hires/2:** additional opportunities to hire permanent staff for the implementation of PNRR projects;
- **SOUTH competition:** recruitment of 2,022 additional units to support administrations in the South for the implementation of national and European cohesion policies, with more favorable criteria for young graduates;
- **1,000 positions for administrative activities:** regions can establish 1,000 collaborative positions with professionals and experts to support administrative processes related to the implementation of the PNRR, with 40% reserved for the South;
- **new forces in the South:** collaboration contracts with specialized personnel and professionals;
- **resources from European Structural Funds:** possibility to use resources from the Complementary Operational Programs (POC) for technical and operational support;
- **consulting for experts in large cities:** municipalities with over 250,000 inhabitants can enter into consulting and collaboration agreements with qualified experts to accelerate projects;
- **support for large municipalities in "pre-crisis":** municipalities with over 250,000 inhabitants can strengthen the staff of offices under the mayor's administration;
- **fund for idea and project competitions:** municipalities with up to 30,000 inhabitants can organize idea and project competitions in the fields of urban planning and social innovation or use such resources for technical and economic feasibility studies;
- **technical support from state-owned companies:** qualified experts for technical-operational support from Consip, Invitalia, Difesa Servizi, and Sogei;
- **support services for contracting authorities:** staff training by Consip;
- **agreement with Cassa Depositi e Prestiti**;
- **task force for school buildings**.

Health: investments to strengthen the healthcare system, improve prevention, manage healthcare emergencies, and promote innovation in the health sector. This includes projects to enhance healthcare infrastructure, digitalize healthcare services, improve the training of healthcare personnel, and promote scientific research in the field of health.

To finance additional interventions, the Italian government has also approved an additional fund of €30.6 billion, bringing the total to €222.1 billion. The Ministry of Economic Development (MISE) is responsible for ten investment projects and one reform project. Each project has been designed to follow the "Specific Recommendations" of the European Commission while strengthening the country's growth potential.

The PNRR proposal focuses on three key areas of intervention shared at the European level: digitalisation and innovation, ecological transition, and social inclusion. According to the estimates in the same plan, the Govern-

ment expects a 3.6 percentage point increase in GDP and a 3.2 percentage point increase in employment by 2026. The plan is structured into four areas:

- General objectives;
- Reforms and Missions;
- Implementation and monitoring;
- Macroeconomic impact assessment.

Going into more detail, the PNRR is structured along 16 Components, aimed at achieving the economic and social objectives defined in the Government's strategy. These components are grouped into 6 Missions, for each of which the necessary reforms for more effective implementation of interventions are outlined.

To prepare for the implementation of the PNRR, the Ministry of Culture (MiC) has internally organized the establishment of a mission unit at the managerial level within the central administrations. This unit is responsible for communicating with the Coordination Unit of the Presidency of the Council and the Central Governance Unit of the Plan at the Ministry of Economy and Finance (MEF). Additionally, in the field of protection and enhancement of built heritage, there is a Special Superintendency for the PNRR, which will be responsible for the protection of cultural and landscape assets affected by the rehabilitationplan's interventions, subject to Environmental Impact Assessment (VIA) at the national level or falling within the territory of at least two peripheral offices of the Ministry (DPCM 6/2021). This Superintendency, referred to as the General Directorate, is entrusted to the General Director for Archaeology, Fine Arts, and Landscape (ABAP) of the Ministry of Culture (MiC) and is supported by a Technical Secretariat. Sixty-three reforms in total, which can be divided into the following types:

- **horizontal reforms** (or contextual reforms), structural innovations in the legal system aimed at improving equity, efficiency, competitiveness, and the economic framework of the country;
- **enabling reforms**, esigned to ensure the implementation of the Plan and, in general, to remove administrative, regulatory, and procedural obstacles that affect economic activities and the quality of services provided;
- **sectoral reforms** (included in the individual Missions), regulatory innovations related to specific intervention areas or economic activities, intended to introduce more efficient regulatory and procedural frameworks in their respective sectors;
- **competing reforms**, i.e., measures not directly included in the Plan but necessary for achieving the overall objectives of the PNRR (such as, for example, tax reform or strengthening the social safety net system).

I.6.2.1 Initiatives and opportunities of the PNRR

Digital Innovation in Italy

The National Rehabilitationand Resilience Plan defines objectives and interventions that span various sectors of Italy's economic and social spheres. From Tourism to Culture, from Agriculture to Logistics, from Education to Employment, from Healthcare to Public Administration. The common denominator within the Reforms and Missions defined in the Plan is Digital Innovation. The Plan dedicates an entire mission (Mission 1) to digital innovation, one of the six missions it is structured around. Over 40 billion euros, in addition to digitalisation initiatives in other missions, bringing the total value to over 65 billion euros.

PNRR and Digitalisation of the Public Administration

The Public Administration (PA) plays a central role in the implementation of the PNRR. It is enough to note that 60% of the resources allocated to the Plan are destined for central PA (such as INPS), local PA (such as Municipalities), or public enterprises (e.g., Trenitalia), and all the resources are

managed by Ministries or Departments of the Presidency of the Council, i.e., the PA. The PNRR dedicates an entire component of Mission 1 to the Public Administration, specifically aimed at the digital transition of the PA. This area includes various reforms and investments aimed at completing many initiatives already started with the Three-Year Plan and accelerating efforts in historically underdeveloped areas, such as the Cloud migration of public services, digital skills, and the simplification of administrative and judicial processes.

PNRR and Healthcare
Mission 6 of the PNRR dedicates a significant section to Health and Healthcare reforms and investments, particularly aimed at strengthening and developing territorial networks and healthcare services, as well as enhancing digital skills in the doctor-patient relationship and the use of tools such as the Electronic Health Record and Telemedicine. This represents a unique moment in the history of investments and changes in the Italian Healthcare System aimed at innovating the National Health Service.

PNRR and Tourism
Among the numerous economic sectors involved in the PNRR, tourism is one of the main areas of intervention, with investments aimed at improving infrastructure, services, and offerings. Mission 1, focused on the digital transition of the Italian production system, aims to boost tourism and culture through the allocation of 2.4 billion euros. Digitalisation, competitiveness, and the *green* transition are the main objectives pursued by the PNRR.

PNRR and the Primary Sector
Among the PNRR measures, Mission 2 includes the allocation of 5.2 billion euros for the agricultural sector to support technological innovation. Firstly, an upgrade in agricultural machinery is foreseen, which is key to the Agricultural 4.0 market. Additional measures focus on technological innovation in the sector, a transformation that could make a difference for all actors involved in the agri-food supply chain.

PNRR and the Labor Market
Various interventions are aimed at the selection and training of employees within the Public Administration, the development of digital skills necessary to support the *green* and digital transitions, and the reform of active labor policies and vocational training.

PNRR and Digital Identity
In Mission 1, dedicated to digital transition and competitiveness, the Plan provides an integrated offer of digital services aimed at optimizing processes, reducing Public Administration times, and simplifying life for citizens, businesses, and entities. Regarding digital identity, the plan aims to strengthen the system by building on existing platforms (SPID and CIE), before converging towards a new solution with a better user experience and greater accessibility to digital services.

PNRR and Startups
The *startup* ecosystem is also involved in the PNRR plan, although to a limited extent. On one hand, funds are allocated for *startup*s and venture capital active in ecological transition within the framework of Mission 2. On the other hand, the Plan seems to focus primarily on other types of investments and reforms mainly related to the Public Administration.

PNRR and Space Economy
Within Mission 1, 1.49 billion euros have been allocated to the Space Economy, the new frontier phenomenon that combines space and digital technologies to develop technological and business opportunities. The space

economy actually encompasses several missions of the PNRR. For example, space technologies can contribute significantly to the *green* revolution and ecological transition sought in Mission 2. Other applications, such as satellite tracking, can support sustainable mobility and logistics (Mission 3) or even Healthcare and Telemedicine (Mission 6).

PNRR and Supply Chain Finance
Within Missions 1, 2, and 3, there are interesting opportunities for the Supply Chain Finance market, a set of innovative solutions that allow a company to finance its working capital. Specifically, three solutions benefit from the PNRR measures: Equipment Finance, Transfer of Tax Credits, and *Deep Tier Finance*.

PNRR and Smart Buildings
To keep pace with the rest of Europe, the PNRR plans to equip more and more infrastructures, both public and private, with high levels of connectivity, also leveraging the functionalities of other technological applications, including *IoT* systems. Not only advanced sensors applied to production processes, mobility, or logistics, but entire connected ecosystems within private homes and public buildings, often characterized by outdated structures, high maintenance costs, and significant inefficiencies in terms of energy consumption. Transforming these structures into real *Smart Buildings* such as schools, cinemas, and theaters.

PNRR and Smart Cities
From energy efficiency to mobility, from security to the regeneration of urban spaces, to the digitalisation of local authorities: alongside Smart Buildings, the PNRR also permeates the Smart City and *Smart Village* themes. The application areas of the National Rehabilitationand Resilience Plan that fall within the sphere of influence of smart cities and villages are many, and the potential of the interventions is very high, though still largely to be unraveled. Elements of Smart Cities are present in at least three of the six missions defined by the PNRR, particularly in Mission 5, which discusses Integrated Urban Plans, but not only.

The implementing entities at the ministerial level for the cultural investments foreseen by the PNRR are:

- **Investiment 1.1:** Digital Strategy and Platforms for Cultural Heritage - Central Institute for the Digitalisation of Cultural Heritage - Digital Library;
- **Investiment 1.2:** Removal of physical and cognitive barriers in museums, libraries, and archives to enable broader access and participation in culture - General Directorate of Museums;
- **Investiment 1.3:** Improving energy efficiency in cinemas, theaters, and museums - for cinemas, the General Directorate of Museums; for theaters and cinemas, the General Directorate of Cinema and Audiovisual;
- **Investiment 2.1:** Attractiveness of Historic Villages - Service V - Contracts and Program Implementation of the General Secretariat;
- **Investiment 2.2:** Protection and enhancement of rural architecture and landscapes - Service V - Contracts and Program Implementation of the General Secretariat;
- **Investiment 2.3:** Programs to enhance the identity of places: historic parks and gardens - Service V - Contracts and Program Implementation of the General Secretariat;
- **Investiment 2.4:** Seismic safety in places of worship, restoration of cultural heritage from the Fund for Religious Buildings (FEC) and restoration sites for works of art (RehabilitationArt) - for seismic safety, the General Directorate for the Security of Cultural Heritage; for the restoration of FEC heritage, the Special Superintendency of Rome; for RehabilitationArt, Service V - Contracts and Program Implementation of the General Secretariat;

- **Investiment 3.1:** Development of the film industry (Cinecittà Project) - General Directorate of Cinema and Audiovisual;
- **Investiment 3.2:** Capacity building for sector operators - General Directorate for Contemporary Creativity.

INVESTMENT 2.1
ATTRACTIVENESS OF HISTORIC VILLAGES

Due to the specific nature of this thesis, this investment related to the contribution provided by the PNRR for Italy's small inner areas will be further explored. As part of the PNRR investments, the Ministry of Culture (MiC) has published a public notice for "Proposals for interventions for the cultural and social regeneration of small historic villages," aimed at promoting projects for the regeneration, enhancement, and management of the cultural heritage rich in history, art, culture, and traditions present in Italy's smaller towns. The objectives focus on the protection of cultural heritage, social and economic revitalization, employment recovery, and combating depopulation.

This public notice of December 20, 2021 concerns Mission 1 - Digitalisation, Innovation, Competitiveness, and Culture, Component 3 - Culture 4.0 (M1C3), Measure 2 "Regeneration of small cultural sites, cultural, reli-

TAVOLA 1.1: COMPOSIZIONE DEL PNRR PER MISSIONI E COMPONENTI (MILIARDI DI EURO)

M1. DIGITALIZZAZIONE, INNOVAZIONE, COMPETITIVITÀ, CULTURA E TURISMO	PNRR (a)	React EU (b)	Fondo complementare (c)	Totale (d=(a)+(b)+(c))
M1C1 - DIGITALIZZAZIONE, INNOVAZIONE E SICUREZZA NELLA PA	9,75	0,00	1,40	11,15
M1C2 - DIGITALIZZAZIONE, INNOVAZIONE E COMPETITIVITÀ NEL SISTEMA PRODUTTIVO	23,89	0,80	5,88	30,57
M1C3 - TURISMO E CULTURA 4.0	6,68	0,00	1,46	8,13
Totale Missione 1	**40,32**	**0,80**	**8,74**	**49,86**
M2. RIVOLUZIONE VERDE E TRANSIZIONE ECOLOGICA	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M2C1 - AGRICOLTURA SOSTENIBILE ED ECONOMIA CIRCOLARE	5,27	0,50	1,20	6,97
M2C2 - TRANSIZIONE ENERGETICA E MOBILITA' SOSTENIBILE	23,78	0,18	1,40	25,36
M2C3 - EFFICIENZA ENERGETICA E RIQUALIFICAZIONE DEGLI EDIFICI	15,36	0,32	6,56	22,24
M2C4 - TUTELA DEL TERRITORIO E DELLA RISORSA IDRICA	15,06	0,31	0,00	15,37
Totale Missione 2	**59,47**	**1,31**	**9,16**	**69,94**
M3. INFRASTRUTTURE PER UNA MOBILITÀ SOSTENIBILE	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M3C1 - RETE FERROVIARIA AD ALTA VELOCITÀ/CAPACITÀ E STRADE SICURE	24,77	0,00	3,20	27,97
M3C2 - INTERMODALITÀ E LOGISTICA INTEGRATA	0,63	0,00	2,86	3,49
Totale Missione 3	**25,40**	**0,00**	**6,06**	**31,46**
M4. ISTRUZIONE E RICERCA	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M4C1 - POTENZIAMENTO DELL'OFFERTA DEI SERVIZI DI ISTRUZIONE: DAGLI ASILI NIDO ALLE UNIVERSITÀ	19,44	1,45	0,00	20,89
M4C2 - DALLA RICERCA ALL'IMPRESA	11,44	0,48	1,00	12,92
Totale Missione 4	**30,88**	**1,93**	**1,00**	**33,81**
M5. INCLUSIONE E COESIONE	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M5C1 - POLITICHE PER IL LAVORO	6,66	5,97	0,00	12,63
M5C2 - INFRASTRUTTURE SOCIALI FAMIGLIE, COMUNITÀ E TERZO SETTORE	11,17	1,28	0,34	12,79
M5C3 - INTERVENTI SPECIALI PER LA COESIONE TERRITORIALE	1,98	0,00	2,43	4,41
Totale Missione 5	**19,81**	**7,25**	**2,77**	**29,83**
M6. SALUTE	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M6C1 - RETI DI PROSSIMITÀ, STRUTTURE E TELEMEDICINA PER L'ASSISTENZA SANITARIA TERRITORIALE	7,00	1,50	0,50	9,00
M6C2 - INNOVAZIONE, RICERCA E DIGITALIZZAZIONE DEL SERVIZIO SANITARIO NAZIONALE	8,63	0,21	2,39	11,23
Totale Missione 6	**15,63**	**1,71**	**2,89**	**20,23**
TOTALE	191,50	13,00	30,62	235,12

Tab. I.6.2.1.1 | Composition of the PNRR by missions and components. ©PNRR, 2022.

gious, and rural heritage," Investment 2.1: "Attractiveness of historic villages," funded by the European Union - NextGenerationEU.

The components of this notice mainly focus on two intervention lines:

- **Intervention Line A:** implementation of 21 projects of particular importance and significance, with a budget of 20 million euros each, selected by regions and autonomous provinces.
- **Intervention Line B:** implementation of local cultural and social regeneration interventions in at least 229 historic villages.

The recipients of Intervention Line B are small municipalities, either individual or grouped (up to 3), with a population of up to 5,000 inhabitants, in which a recognizable historic village is present. The PNRR resources, distributed among the regions and provinces, are allocated 40% to the South and 60% to the Center-North.

I.6.2.2 Investment 2.1 "Attractiveness of Historic Towns"

Investment 2.1 – Attractiveness of Historic Towns – Line A

As part of the Investment, but for municipalities with more than 5,000 inhabitants, and thus more populated, 420 million euros are allocated to Line A, which will support pilot projects for the cultural, social, and economic regeneration of villages at risk of abandonment or already abandoned, through the implementation of a limited number of exemplary interventions, one for each Region or Autonomous Province, totaling 21 projects and a budget of 420 million euros. Each intervention will amount to 20 million euros and is aimed at the economic and social revitalization of depopulated villages or those characterized by an advanced process of decline and abandonment. The projects include the establishment of new functions, infrastructures, and services in the fields of culture, tourism, social services, or research, such as schools or academies of arts and cultural crafts, widespread hotels, artists' residencies, research centers and university campuses, residential care homes (RSA) where cultural programs will also be developed, residences for families with workers in smart working and digital nomads.

For this line of action, Regions and Autonomous Provinces submitted their proposals to the Ministry of Culture (MiC); a negotiation phase followed, conducted by a Technical Committee established by MiC, which included a representative from the Regions, a representative from ANCI, and a representative from the associations participating in the coordination committee for villages. The negotiation process, aimed at verifying the consistency of the project proposals with the processes and timelines of the PNRR, concluded with the admission of 20 proposals for funding.

- Abruzzo: Rocca Calascio (AQ)
- Basilicata: Monticchio Bagni (PZ)
- Calabria: Gerace (RC)
- Campania: Sanza (SA)
- Emilia-Romagna: Campolo (BO)
- Friuli-Venezia Giulia: Borgo Castello (GO)
- Lazio: Trevinano (VT)
- Liguria: Borgo Castello (SV)
- Lombardia: Livemmo (BS)
- Marche: Montalto delle Marche (AP)
- Piemonte: Elva (CN)
- Puglia: Accadia (FG)
- Sardegna: Ulassai (NU)
- **Sicilia: A Cunziria (CT)**
- Toscana: Borgo di Castelnuovo in Avane (AR)
- Umbria: Cesi (TR)
- Valle d'Aosta: Arvier (AO)
- Veneto: Recoaro Terme (VT)
- Provincia di Bolzano: Stelvio (BZ)

- Provincia di Trento: Palù del Fersina (TN)

Investment 2.1 – Attractiveness of Villages – Line B
The Notice was aimed at small municipalities, either individual or aggregated, with a resident population of up to 5,000 inhabitants, where a clearly identifiable and recognizable historic village was present. Aggregations of municipalities could involve neighboring municipalities or those within the same region that shared similar themes. In the case of aggregations of more than one municipality, up to a maximum of three, each municipality had to have a historic village. For aggregated municipalities, the application had to be submitted by the municipality acting as the proposer and lead partner.

Line B, aimed at supporting Local Projects for Cultural and Social Regeneration, received a total funding of 580 million euros. Additionally, 20 million euros were allocated to the "Roots Tourism" initiative, managed by the Ministry of Foreign Affairs and International Cooperation.

It benefited from a financial allocation of 380 million euros and was aimed at the implementation of projects in at least 229 historic villages, in line with the target set in the investment 2.1 PNRR-M1C3-Culture document. Subsequently, through a separate procedure and with a financial allocation of 200 million euros, enterprises operating in the cultural, tourism, commercial, agri-food, and craft sectors in the same municipalities targeted by the cultural and social regeneration projects were centrally supported under the responsibility of the Ministry of Culture.

The public notice, dedicated to small historic villages, aimed to promote projects for the regeneration, enhancement, and management of the rich heritage of history, art, culture, and traditions present in small Italian towns. This initiative integrated the goals of protecting cultural heritage with the needs of social and economic revitalization, job creation, and combating depopulation.

The eligible projects for funding had to contribute to the renewal of the socio-economic fabric of these areas by regenerating public spaces, restoring historic-architectural heritage, and activating entrepreneurial and commercial initiatives capable of generating employment in the territory.

Among the projects funded by the PNRR, two initiatives stand out for their significant contribution to innovation.

Innovative Schools: The "Innovative Schools" project of the Ministry of Education, aimed at renovating school buildings and equipping them with new technologies, has received an investment of 1.5 billion euros. This investment is being used for renovation, safety improvements, and the installation of new technologies in 2,000 schools across Italy. The main objectives of the project include improving the quality of education through the use of innovative technologies, such as distance learning, virtual reality, and augmented reality; making schools safer and more welcoming through building renovations and safety measures; and promoting inclusion and participation for students with disabilities or learning difficulties.
The project has already been completed in about 500 schools and shows the first encouraging results, highlighting how new technologies can improve student learning and make schools more inclusive.

Renewable Energy: The "Renewable Energy" project by the Ministry of Ecological Transition aims to promote the use of clean and sustainable energy. An investment of 19.4 billion euros has been used to develop solar, wind, and geothermal energy production plants. The main objectives of the project include: reducing dependence on fossil fuels and cutting *green*house gas emissions; creating new jobs in the renewable energy sector; and contributing to the decarbonization of the Italian economy.
The project has led to the creation of over 1,000 new renewable energy production plants, helping to reduce Italy's dependence on fossil fuels and improve air quality. These are just a few examples of the many projects and ini-

tiatives that have been implemented or are underway as part of the PNRR.

I.6.2.3 PNRR Culture: Enhancement of architecture and rural landscape

In the context of the funding outlined by the PNRR, particular attention is given to rural architecture, with the goal of recovering the entire landscape, overcoming the limited focus on the historic centers of small inner towns in Italy, and embracing the landscape, including isolated heritage sites.

The importance of recovering rural architecture plays a crucial role in creating a harmonious connection between the historic center and the surrounding landscape. It is an inseparable synergy of history, environment, and anthropic landscape. The concept of landscape here takes on a broader meaning, characterized as a seamless fusion between nature and the man-made.

The proposal promotes a systematic process of identification, conservation, and enhancement of a diverse heritage, understood as "villages." The primary objective is to preserve the uniqueness of the rural landscape while simultaneously contributing to the protection of cultural heritage and stimulating local development.

The challenges faced are numerous:

- preserve the distinctive elements of historic rural landscapes, with particular attention to the specific distribution of scattered buildings; numerous structures have suffered from abandonment and decay, putting at risk their typological features and their connection with the surrounding spaces;
- educe regional disparities in the country, promoting the creation of employment and mitigating the social and economic impact of the pandemic crisis: the intervention aims to strengthen rural economies and support tourism in inner areas, enhancing products linked to agriculture and traditional craftsmanship, with particular attention to the Madonie.

In addition to generating employment in the agricultural and construction sectors, the proposal acts as a counter-cyclical measure by involving operators and professionals specialized in landscape and architectural rehabilitation, focusing on vernacular architecture and its integration into the environmental fabric.

The main objectives of the investment include: preserving the values of historic rural landscapes within protected areas, safeguarding and enhancing cultural heritage (both tangible and intangible), and promoting traditional agricultural practices essential for maintaining the uniqueness of the landscape while encouraging initiatives related to sustainable tourist-cultural use, respecting local traditions and culture, and adapting them to local specificities.

The total investment amounts to 600 million euros, of which 590 million are allocated for the restoration of agricultural settlements and historic rural buildings, including scattered and isolated ones in the Madonie area. The remaining 10 million euros are dedicated to activities for cataloging rural heritage assets and implementing information systems.

The initiative, coordinated by the Ministry of Culture, has already achieved successes with numerous interventions, although the results may have been more significant. This step is of considerable importance, especially considering that, beyond the picturesque villages, Southern Italy and Sicily host a range of isolated heritage assets within the landscape.

This incentive not only aims to restore rural architecture but also serves as a valuable ally in preserving and enhancing a vast heritage. The initiative adds value to the territory by contributing to the preservation of historical and cultural traces that characterize particularly the smaller towns. The diversity and spread of these assets, scattered across the territories, add authenticity and charm to this corner of Sicily, making it even more attractive for

residents and visitors.

The investment aims to enhance historic rural buildings with the goal of increasing tourist flow to the peripheral areas of the country, as well as improving the protection of the surrounding landscape. Through the restoration of abandoned or aging buildings, it is expected to create new jobs, reduce regional disparities, and mitigate the impact of the crisis. This process will also help enhance local craftsmanship and promote agricultural products from the region.

This investment aims to promote a systematic process of valorizing historic rural buildings, both private and those belonging to third-sector entities, while protecting the landscape. Numerous rural buildings and agricultural structures have undergone gradual abandonment, decay, and alterations, compromising their distinctive characteristics and their relationship with the surrounding spaces.

By recovering the rural building heritage, the intervention will contribute to improving the landscape quality of the national territory, returning to the community an underutilized building heritage that is currently inaccessible to the public.

The positive implications of this intervention will reflect on local economies, promoting sustainable tourism in rural areas and enhancing production linked to agriculture and traditional craftsmanship.

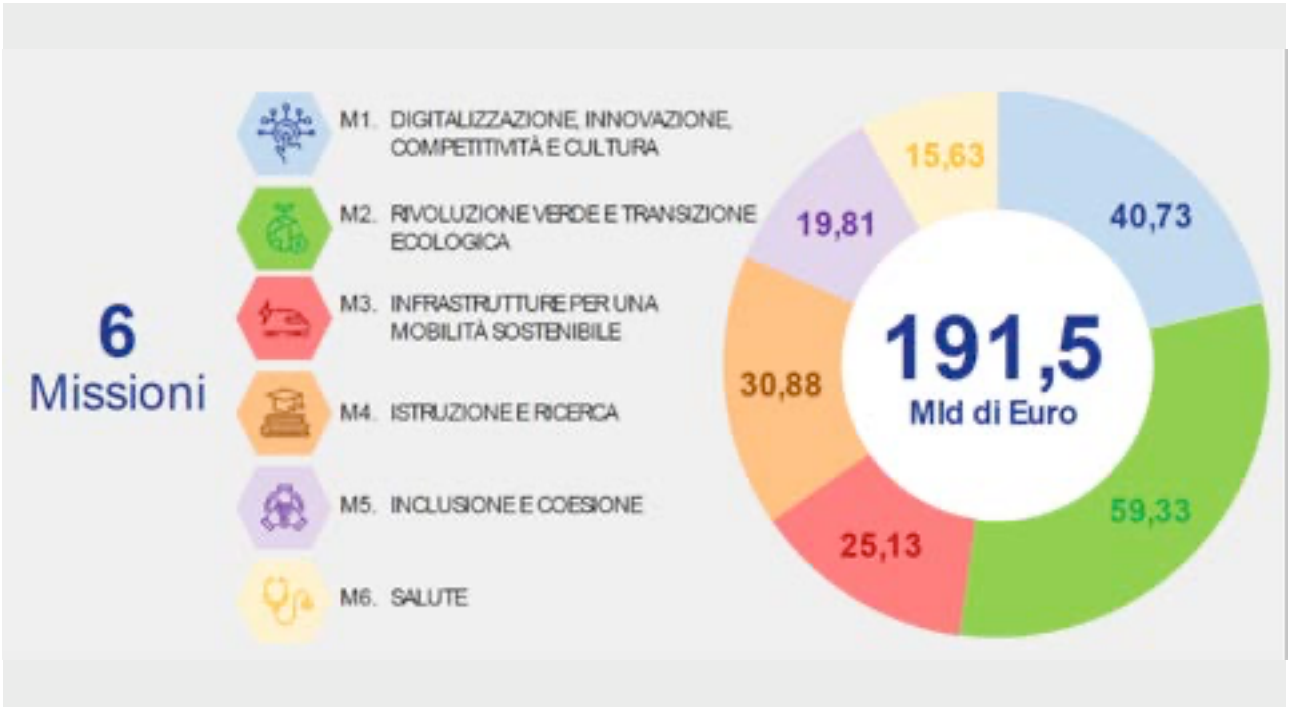


Fig. I.6.2.2.1 | The six main missions of the PNRR ©PNRR, 2022.

I.6.3 National Plan for the revitalization of small municipalities

The National Plan for the Revitalization of Small Municipalities is a public investment plan aimed at supporting sustainable development, demographic balance, the protection and enhancement of natural, rural, historical-cultural, and architectural heritage, as well as the system of essential services in small municipalities in Italy. The plan was approved by the Council of Ministers on July 20, 2022, and provides a total investment of 1.3 billion euros for the period 2022-2026. This important initiative aims to support the development of Italy's small municipalities, which represent a significant portion of the country's territory and population. The beneficiaries of the plan are small municipalities in Italy, defined by a population of fewer than 5,000 inhabitants. Projects must be submitted by municipalities individually or in association, and eligible projects relate to interventions in:

- urban regeneration and enhancement of real estate heritage;
- promotion of economic and social development;
- protection and enhancement of the environment;
- improvement of public services.

Among the projects that can be funded by the Plan:

- **revitalization of historic centers:** projects for the revitalization of historic centers may include interventions for the conservation and restoration of historic buildings, the creation of public and pedestrian spaces, and the promotion of cultural and tourist activities;
- **rehabilitation of abandoned public buildings:** abandoned public buildings can be recovered to host social, cultural, and economic activities or be converted into housing.
- **development of infrastructure for sustainable mobility:** infrastructure for sustainable mobility, such as bicycle paths, hiking trails, and local public transport, can contribute to improving quality of life and reducing pollution.
- **promotion of tourism and cultural activities:** tourism and cultural activities can help create jobs and promote local economic growth.
- **investments in agriculture and rural development:** investments in agriculture and rural development can help preserve the environment and promote the production of local food.

The plan represents an opportunity for small municipalities to improve their service offerings and attractiveness, aiming to attract new residents and economic activities. Beyond the national calls for proposals promoted, **INVITALIA**[1], an Italian government agency, aims to foster the economic and social development of the country. Among its various initiatives, one of the most significant is its commitment to promoting calls for proposals for the revitalization of Italy's small municipalities. These calls are designed to provide financial incentives and technical support to municipalities seeking to undertake projects for the renewal and improvement of their communities.

A key aspect of this commitment is the allocation of funds for projects involving infrastructure, public services, tourism, culture, and much more. Invitalia collaborates with local authorities to identify the specific needs of small municipalities and develop targeted action plans. These plans aim to improve the quality of life in these towns, making them more attractive places for residents and visitors.

The promoted calls often offer opportunities for funding and technical support for a wide range of projects. These projects may include the redevelopment of urban areas, the promotion of local tourism, the development of cultural initiatives, and the creation of new local businesses. The ultimate goal is to stimulate economic growth, create jobs, and preserve Italy's cultural heritage in small municipalities.

[1]The agency not only provides financial resources but also offers assistance in developing project proposals and managing the allocated funding. This support is crucial for small municipalities, which often have limited resources and require help navigating the complex process of accessing public funding.

I.6.4 SNAMI - National Strategy for Italian Mountain Areas

The National Strategy for the Italian Mountains (SNAMI) is an initiative funded through the Fund for the Development of Italian Mountains (FOSMIT). This fund gathers resources from the National Mountain Fund and the Supplementary Fund for Mountain Municipalities, with an allocation of €100 million for 2022 (compared to the previous €29.5 million) and €200 million starting from 2023, as established by the recent budget law. The significant increase in funds will ensure coverage for the planned support measures. This was outlined in a draft law approved by the Council of Ministers to promote the development of the country's mountainous areas.

Specifically, incentives are provided for doctors and social-healthcare workers employed in mountain municipalities, and privileged access is granted to the role of medical director for doctors who have practiced in mountain areas. Tax benefits are also available for operators who rent or purchase properties in mountain municipalities.

The Council of Ministers, on the proposal of then Prime Minister Mario Draghi and the Minister for Regional Affairs and Autonomies, Mariastella Gelmini, approved the draft law titled "Provisions for the Development and Valorization of Mountain Areas", which introduces comprehensive measures aimed at fostering economic development and the revitalization of many areas that have the opportunity to increasingly become a resource for the country. It also aims to counter depopulation in Italian mountain areas, consolidating legislative interventions into a single text to reduce the disadvantaged conditions of mountain municipalities. Finally, it establishes criteria for identifying mountain municipalities and regulates the additional parameters for accessing the incentives and support provided.

Through SNAMI, the Minister for Regional Affairs and Autonomies identifies the strategic guidelines for economic and social growth, accessibility to essential services and digital infrastructure, and the full enjoyment of fundamental rights in mountain areas.

The measures adopted by the draft law specifically address:

- **mountain healthcare:** incentives are provided for doctors and social-healthcare workers employed in mountain municipalities. Specifically, privileged access is granted to the position of medical director for doctors who have practiced in mountain areas. Additionally, a tax credit is granted to doctors and social-healthcare workers who rent or purchase a residential property in mountain municipalities eligible for such benefits;
- **mountain schools:** facilitating measures and incentives are planned for teachers working in mountain areas. Incentive schemes, including service score benefits, are introduced for temporary teachers in mountain schools at all levels. Furthermore, mountain teachers are granted a tax credit for housing under the same conditions provided for doctors and social-healthcare workers in mountain areas;
- **mobile phone services and internet access:** High-speed internet access and infrastructure improvements are encouraged to ensure continuity of mobile phone services. Measures under the National Rehabilitationand Resilience Plan (PNRR) are further strengthened, extending their reach to territories excluded from the PNRR;
- **incentives for agricultural and forestry entrepreneurs:** a contribution in the form of a tax credit is provided to agricultural and forestry entrepreneurs operating in mountain municipalities who invest in environmentally and climate-beneficial practices. The specific practices for agricultural entrepreneurs will be identified by a decree from the Minister of Agricultural, Food, and Forestry Policies. For forestry entrepreneurs, these practices include crop diversification, maintaining or introducing areas of ecological interest, and preserving permanent grasslands;
- **fiscal measures for "young" mountain enterprises:** a tax credit is introduced for the first three fiscal periods, targeting small and microenterprises starting their business in mountain municipalities eligible for this

incentive, where the owner or at least one of the proprietors is under 36 years of age;

- **"I Stay in the Mountains" measure:** this measure aims to encourage residency in mountain areas. Taxpayers under the age of 41 are granted a higher tax deduction than the standard one for interest payments on mortgages taken out for the purchase of their primary residence. The deduction applies to mountain municipalities with a resident population not exceeding 2,000 inhabitants that are eligible for this form of benefit.

The program titled "Io Resto in Montagna" was presented as part of the bill "Provisions for the Development and Enhancement of Mountain Areas", approved by the Council of Ministers on July 20, 2022. This initiative aims to encourage residency in mountainous regions by offering tax benefits that exceed those normally provided for interest payments on mortgages taken out for the purchase of primary homes in mountain municipalities with a resident population not exceeding 2,000 inhabitants. The tax deduction offered amounts to 30% of the interest paid over the first three fiscal periods, with a maximum limit of 1,500 euros per fiscal period. This tax benefit can be combined with other incentives available for purchasing a first home.

This initiative holds significant relevance in addressing the depopulation phenomenon affecting mountain regions. The tax incentive serves as a tangible encouragement for young people and families to choose to settle in these areas, where they can enjoy a unique natural environment and a quieter atmosphere. Although the project is still in the implementation phase, it has already sparked considerable interest. According to a survey conducted by the Ministry for Regional Affairs and Autonomies, 40% of young Italians express interest in living in mountainous areas.

"Io Resto in Montagna" represents just one of the measures included in the National Strategy for the Italian Mountains (SNAMI) to counter depopulation. Other measures include incentives for doctors and social-healthcare workers operating in mountain areas, tax benefits for agricultural and forestry entrepreneurs, and funding aimed at developing infrastructure.

The implementation of SNAMI represents a significant opportunity to revitalize mountain areas and make them more attractive to young people and families, contributing to the overall well-being of Italy's mountainous regions.

Fig. I.6.4 | An Italian landascape ©FASI, 2022.

I.6.5 SNAC – National Strategy for Climate Change Adaptation

On October 30, 2014, the Ministry of the Environment launched the National Strategy for Climate Change Adaptation (SNAC, MATTM 2015), a significant document providing a national strategic vision on addressing the impacts of climate change as defined in the 2013 European Climate Change Adaptation Strategy, subsequently revised in 2021. The Strategy was drafted by the Ministry of the Environment and the Protection of Land and Sea[1], with scientific coordination from the CMCC[2], and received approval from the Unified Conference.

The Strategy's implementation tool is the National Plan for Climate Change Adaptation, which defines actions and priorities at both national and local levels to mitigate the impact of climate change on the environment, socio-economic sectors, and natural systems in Italy. It identifies the primary impacts of climate change on environmental resources and significant national socio-economic sectors, proposing initial adaptation actions for each. Its aim is to minimize risks posed by climate change, protect public health, well-being, and assets, preserve natural heritage, maintain or improve the resilience and adaptive capacity of natural, social, and economic systems, and leverage potential opportunities arising from new climatic conditions.

To achieve its objectives, the Strategy outlines the following actions: improving current knowledge of climate change and its impacts; assessing territorial vulnerability and adaptation options for natural systems and relevant socio-economic sectors, as well as associated opportunities; promoting participation and raising awareness among *stakeholders* through extensive communication and dialogue to integrate adaptation effectively into sectoral policies; supporting awareness and information campaigns on adaptation through widespread communication about possible hazards, risks, and opportunities arising from climate change; and specifying tools to identify the best adaptation options while emphasizing co-benefits.

In addition to serving as a reference framework for adaptation for regions and municipalities, the SNAC provides objectives, principles, and a set of sectoral and cross-sectoral adaptation actions (in areas such as water resources, agriculture, health, transport, energy, etc.). This marks progress towards sustainable development in Italy, offering new tools to prevent and manage climate risks in key sectors and to generate added value from climate change knowledge.

The Strategy outlines four specific objectives: reducing the vulnerability of natural, social, and economic systems to climate change impacts; increasing their adaptive capacity; enhancing the exploitation of opportunities; and coordinating actions at various levels. Supporting documents include: "Report on the state of scientific knowledge on climate impacts, vulnerability, and adaptation in Italy", "Analysis of relevant European and national regulations on impacts, vulnerability, and climate adaptation", and "Elements for a National Strategy for Climate Change Adaptation".

Annexes to the SNAC include: an in-depth chapter on the European Strategy for Climate Change Adaptation and strategies and plans adopted in other European countries; a set of proposed actions categorized as non-structural actions, ecosystem-based actions, infrastructural and technical actions, and cross-sectoral actions, both short- and long-term.

The SNAC represents a key response by Italy to the global challenges posed by climate change. This strategy aims to protect communities, natural resources, and the national economy through climate adaptation measures, a critical component particularly for Italy's small, inner rural areas, which serve as repositories of the country's heritage.

As illustrated in Figure 2, it is important to emphasize the need for targeted action, particularly in Southern Italy, where rising temperatures have had a significant impact on economic performance.

[1] Governing Body responsible for implementing environmental policy. Established in 1986, it performs functions in the following areas: biodiversity protection, safeguarding ecosystems and marine-coastal heritage, land and water conservation, policies to combat climate change and global warming, sustainable development, energy efficiency and circular economy, integrated waste cycle management, reclamation of Sites of National Interest (SIN), environmental assessment of strategic projects, and combating air, noise, and electromagnetic pollution, as well as risks arising from chemical products and genetically modified organisms. It provides guidance and oversight of the activities of the Higher Institute for Environmental Protection and Research (ISPRA) and national parks and marine protected areas. It promotes best environmental practices, sustainable mobility, and urban regeneration based on sustainability criteria. It is also responsible for promoting environmental education in schools. The body works in collaboration with the Port Authority-Coast Guard and the Carabinieri Command for Forest, Environmental, and Agri-food Protection (CUTFAA).

[2] The Euro-Mediterranean Center on Climate Change (CMCC) is a scientific research foundation operating in the field of climate science. It aims to deepen knowledge about climate variability, its causes, and its consequences through the development of high-resolution simulations using global Earth system models and regional models, with particular focus on the Mediterranean area. The specific objective of this research is to provide scientifically reliable, rigorous, and up-to-date results that contribute to investigating, understanding, and representing the interactions between the climate system and society. It supports sustainable development and offers solid scientific knowledge for the creation of policies to mitigate or adapt to the impacts of climate change.

Fig. I.6.5.1 | National Strategy for Climate Change Adaptation ©MASE, 2014.

Fig. I.6.5.2 | Climate Change Adaptation Strategy ©Gruppo Iren, 2024

I.6.6 PAC 2023-2027 - Action and Cohesion Plan

In Europe, one of the main topics under discussion regarding the new PAC 2023-2027 Programming is related to the development of so-called *Smart Villages*, seen as a strategic tool to strengthen the socio-economic fabric of rural areas. The topic of *Smart Villages* is not a completely new concept introduced by the upcoming five-year community programming period. As early as 2017, the European Union developed the strategic document *EU Action for Smart Villages*, within which villages, or more commonly hamlets, are defined as "c*ommunities located in rural areas that use innovative solutions to improve their sustainability and resilience, based on local strengths and opportunities*" Therefore, it is not a universal model to be applied indiscriminately everywhere but rather an approach that must be contextualized to each territory and should be integrated into broader regional and/or territorial development strategies (such as, for example, the LEADER Local Development Strategies).

The European Commission has given the PAC 2023-2027 a strategic role in promoting *Smart Villages*, providing support for "*Smart Village*" strategies among the cooperation interventions outlined in Article 77 of Regulation (EU) 2021/2115. To further emphasize the importance of this programming approach, the Commission has established a specific result indicator for the PAC Strategic Plans: the indicator R.40 Smart Transition of the Rural Economy, which aims to assess the number of "Smart Village" strategies funded through the PSPs. This type of intervention primarily contributes to specific objective 8 "*Promote employment, growth, gender equality, including women's participation in agriculture, social inclusion, and local development in rural areas, including circular bioeconomy and sustainable forestry*" and represents an additional tool to encourage aggregated territorial and local approaches.

Other Member States have taken different approaches, with *Smart Villages* being the exclusive prerogative of LEADER or one of the investment forms provided for under Articles 73 and 74 of Regulation EU 2021/1060. However, not all Member States have explicitly referred to *Smart Village* strategies in their PSPs, and even fewer have attempted to provide guidance on the targets to be achieved regarding their implementation; among these are Spain, Germany, Austria, Finland, and Italy.

Spain is one of the countries that has chosen to include *Smart Village* strategies among the possible projects financed through the intervention "Non-productive investments in basic services in rural areas." As in Italy, a Member State with regionalized PAC implementation, this intervention will be carried out by 11 of the 17 autonomous communities into which the country is divided. Galicia, for example, intends to finance investments for the provision of telecommunications services, from purchasing equipment to developing the necessary software for proper service delivery, as well as planning, management, or any other activity that contributes to the objectives set in the digitalisation plans. The Valencian Community, on the other hand, has chosen to focus its concept of *Smart Village* on projects aimed at energy independence with renewable energy in municipalities with fewer than 5,000 inhabitants.

Germany has also chosen to direct its support for the smart transition of the rural economy towards the field of digitalisation, in order to provide rural businesses and populations with adequate access to modern information and communication technologies: the German Managing Authority has planned the implementation of eleven operations for broadband expansion.

Austria, however, has adopted a different approach to the *Smart Village* concept, preferring to identify several interventions that contribute to the implementation of *Smart Village* strategies through a bottom-up approach and integrated planning, thanks to cooperation between local actors and not extended to the Local Action Groups (LAGs). With interventions 73-10 – aimed at promoting urban centers, and 77-4 for the revitalization of vacant properties, **Austria** intends to fund investments for the regeneration

and renovation of public areas and/or buildings that are abandoned, underused, or misused. Additionally, there is an effort to raise awareness among citizens, community representatives, and economic operators on strengthening urban centers by financing the preparation and updating of integrated urban development plans for the reuse of revitalized spaces. Another cooperation intervention called "Rural Innovation Systems" aims to fund cooperation strategies for innovation in non-agricultural areas and an innovation network that synergizes partnerships and their respective projects.

Finally, **Finner**has established an intervention called "*Smart Village* Cooperation Projects" identifying three main themes within which beneficiaries can develop their strategies: economic innovation, the social sphere, and environmental protection. For each of the three action areas, a wide range of sectors is identified in which each strategy can focus: transport, smart farming, training, food districts, etc. Other Member States, such as Poland, Slovenia, and Estonia, plan to support *Smart Village* strategies in various ways, particularly focusing on innovation and digitalisation, and above all, aligning with the LEADER approach.

Italy has chosen to build the intervention by interpreting it, as suggested by the CE Tools, as a methodological approach to support the implementation of "strategies" understood as integrated projects, shared by public and/or private local beneficiaries, related to specific sectors/areas of cooperation, aiming to promote the use of innovative solutions in rural communities to improve their resilience, economic, social and/or environmental conditions, local *governance*, relationships, and exchanges with urban areas, also utilizing digital technologies and multifunctional agriculture and forestry. Moreover, in Italy, *Smart Villages* can be incentivized both through LEADER Local Development Strategies and through regional calls for projects.

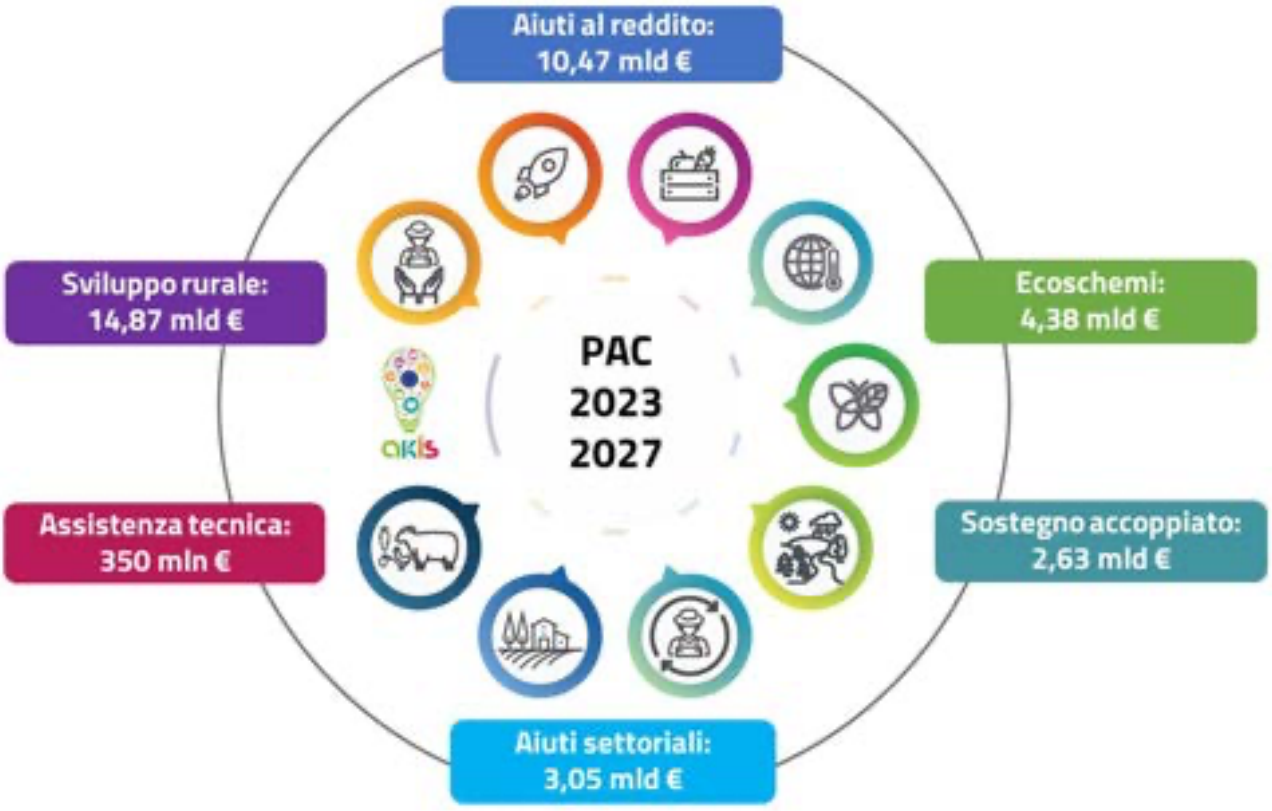


Fig. I.6.6.1 | PAC, Italy presents its Strategic Plan 2023-2027 ©Pianeta PSR, 2024.

I.6.7 Sicilian regulatory framework

Sicily, rich in history, culture, and tradition, boasts numerous smaller towns characterized by an invaluable historical, architectural, and cultural heritage. However, urban decay, depopulation, and the transformation of rural contexts are putting the integrity of these places at risk. In response to this challenge, the Sicilian Region has adopted a series of laws and regulations aimed at promoting the protection and enhancement of these smaller towns, with the goal of preserving their identity and fostering sustainable development. This paragraph aims to provide a detailed analysis of the Sicilian regulations on this matter, focusing on Regional Law No. 13 of July 10, 2015[1], and Regional Law No. 24 of December 22, 2016, as well as examining the main initiatives promoted by the Region to combat depopulation and encourage the revival of these towns.

Regional Law No. 13 of July 10, 2015, is a regulatory tool for the protection and enhancement of Sicily's historic centers. Its objective is to promote the conservation of the architectural heritage and character of these centers, as well as to encourage their economic and social revitalization. Among the main points of the law, there is the simplification of authorization procedures for the restoration and rehabilitation of buildings, through the establishment of a one-stop shop for construction-related activities and the reduction of processing times for permits. Moreover, the law allows for the change of use of buildings, in order to promote the diversification of economic activities in historic centers and combat the phenomenon of depopulation.

Regional Law No. 24 of December 22, 2016, focuses on the urban and territorial regeneration of Sicily's historic villages. It sets the goals for the rehabilitation and enhancement of the architectural and cultural heritage of these villages, with particular attention to combating depopulation and promoting repopulation. The law requires the development of specific plans for each village, which identify the priority interventions and the financial resources needed to implement them. Additionally, the law introduces tax incentives and funding to support economic activities in these villages, with the aim of fostering the development of a sustainable local economy.Both laws offer tax incentives and funding to support the rehabilitation and enhancement of smaller towns, thus promoting the conservation of cultural heritage and the economic growth of the affected areas.

The Sicilian regulations on the protection and enhancement of smaller towns are based on a series of fundamental principles, including the recognition of the historical, architectural, archaeological, and environmental value of these places, as well as the importance of promoting targeted interventions for their conservation and regeneration. Both of the regional laws analyzed present a series of key points, including the definition of protection and enhancement objectives, the identification of eligible interventions, and the introduction of tax incentives and funding to support such interventions. Additionally, both laws require the drafting of specific plans for each town or village, in order to identify priority interventions and ensure effective management of available resources.

In addition to the regional laws, each municipality adopts a General Regulatory Plan (PRG) and a Building Code for the care, protection, and enhancement of the heritage of historic centers, addressing various issues. However, some towns still rely on old PRGs, but with the entry into force of the new regulations, all municipalities will soon be required to update their PRGs to align with the one established by Sicily or the relevant province. This is made possible by the work of the Regional Center for Urban Planning Studies of Sicily (CeRSU[2]).

With the Decree of the President of the Sicilian Region No. 531 of May 20, 2022, the Unified Building Code of the Sicilian Region was approved, in accordance with Article 2 of Regional Law No. 16 of August 10, 2016, and subsequent amendments, as well as Article 29 of Regional Law No. 19 of August 13, 2020, and related integrations.

[1] **Regional Law No. 13 of July 10, 2015** outlines key provisions for the protection and enhancement of historic centers in Sicily. The main points of the law are as follows:
Art. 1: Defines historic centers as "consolidated urban agglomerations of significant historical, architectural, archaeological, and environmental interest."
Art. 2: The main objectives of the law include: Conservation of the built heritage and architectural and typological characteristics.
Improvement of urban quality and living conditions. Promotion of economic and social activities compatible with the historical context.
Art. 3: Requires the preparation of a RehabilitationPlan for each historic center, which must include:
- Delimitation of the historic center area.
- Analysis of the built heritage.
- Identification of rehabilitation and enhancement interventions.

Art. 4: Regulates eligible interventions in historic centers, including: Rehabilitation, restoration, and conservation-oriented renovation of buildings. Extraordinary maintenance, building renovations, and seismic adaptations. Change of use.
Art. 5: Introduces tax breaks and contributions for rehabilitation and enhancement interventions in historic centers.

Regional Law No. 24 of December 22, 2016:
Art. 1: Defines historic villages as "urban ensembles of significant historical, architectural, archaeological, landscape, and environmental value, located in inner areas or at risk of depopulation."
Art. 2: Identifies the objectives of urban and territorial regeneration for historic villages, including:
- Rehabilitation and enhancement of built heritage and cultural assets;
- Combatting depopulation and promoting repopulation;
- Development of sustainable economic and social activities.

Art. 3: Requires the preparation of an Urban and Territorial Regeneration Plan for each historic village, which must include:
- Analysis of the socio-economic and environmental context of the village.
- Identification of rehabilitation and enhancement interventions.
- Estimation of costs and necessary financial resources.

Art. 4: Regulates eligible interventions in historic villages, including:
- Rehabilitation, restoration, and conservation-oriented renovation of buildings.
- Extraordinary maintenance, building renovations, and seismic adaptations.
- Change of use.
- Urban and landscape regeneration interventions.

Art. 5: Introduces tax breaks, contributions, and other forms of support for urban and territorial regeneration interventions in historic villages.

[2] The Regional Center for Urban Studies,

established in 2021 by the initiative of the Consulta of the Engineers' Orders of Sicily, aims to increase interest in urban planning, territorial, environmental, and landscape planning, as well as the related regulatory framework, territorial organization issues, and environmental protection, with a focus on the impact on construction and the reuse of buildings. The Center promotes cultural initiatives, information, and updates within the Sicilian territory. Full members of the Regional Center for Urban Studies are all Engineers in Sicily who share the objectives and goals of the Center. Additionally, anyone who shares the aims and objectives of the Center can join as an affiliated member.

Within 120 days from the publication of the Unified Building Code in the Official Gazette of the Sicilian Region (Official Supplement No. 1 to GURS No. 26 of June 3, 2022), municipalities are required to adopt a new Building Code based on the aforementioned Unified Building Code of the Sicilian Region, making any necessary integrations to adapt its content to local characteristics, as provided by Article 2, paragraph 2, of LR 16/2016 and subsequent amendments.

CeRSU has developed the Guidelines to provide an initial methodological contribution to address the multiple issues related to the definition of the municipal Building Code.

It is emphasized that in the absence of explicit provisions by municipalities within the aforementioned 120-day period, "*the provisions of the regional model Building Code will prevail over the norms of the current municipal building codes, effectively replacing them*."

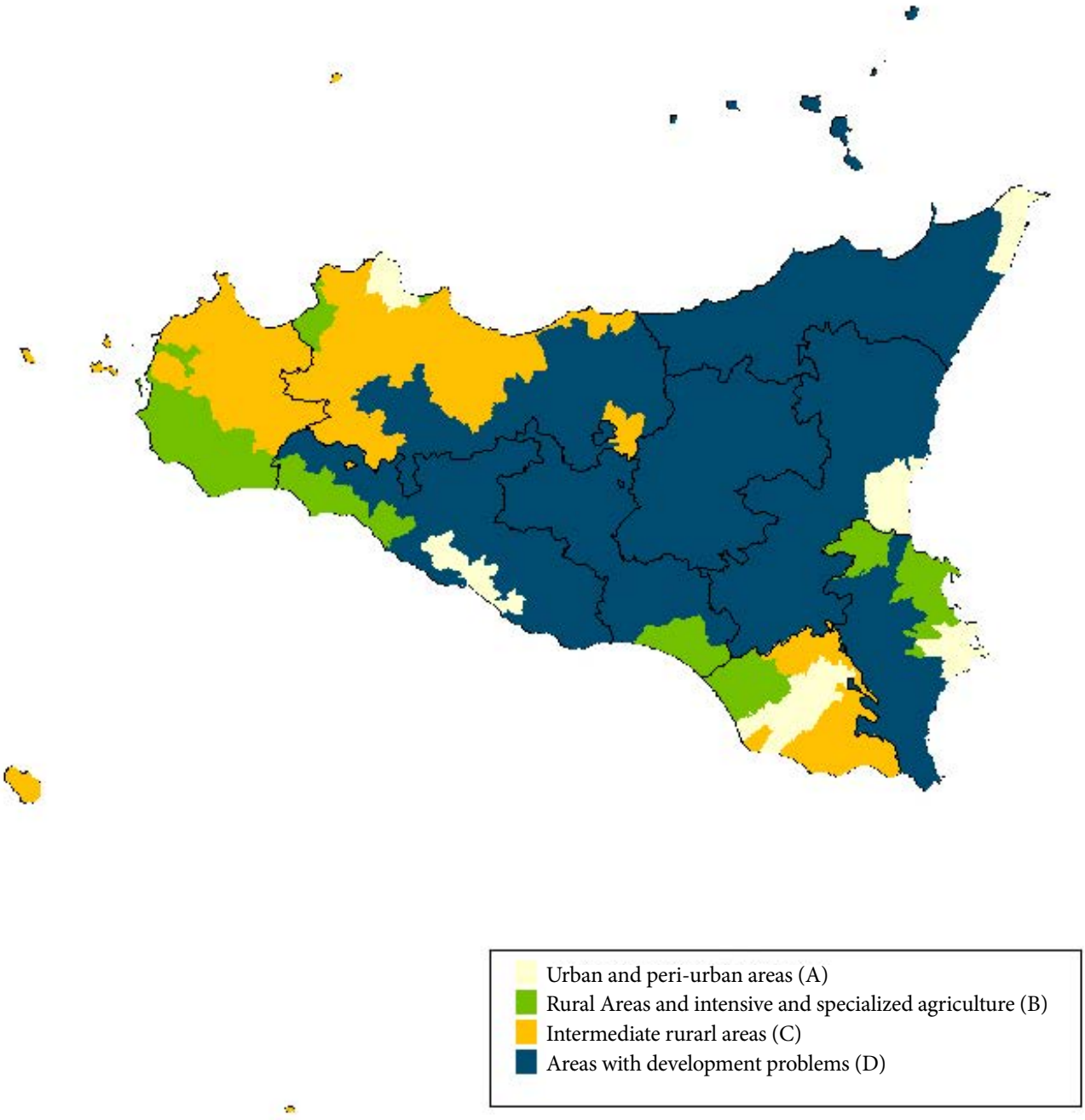


Fig. I.6.7.1 | Sicily and its areas ©National Rural Network, 2021

I.7 Codes and Directives for the protection and enhancement of historic centers

Art. 9 – CONSTITUTIONAL CHARTER
The Republic promotes the development of culture and scientific and technical research.
It protects the landscape and the historical and artistic heritage of the Nation.
/.../ Moreover, the constitutional obligation to promote culture and research, which applies to all branches of the Republic (and thus to the State, as well as to regions and local authorities), requires the embrace and support of that primary direction of contemporary culture which is expressed, in a large measure, in architectural design activity. This activity, therefore, fully falls within the protective scope of the first and second paragraphs of Article 9 of the Constitution. Even more clearly, the specific duty to protect the landscape and the historical and artistic heritage of the Nation, as set out in Article 9, imposes, in practice, the promotion of criteria for the transformation of the territory that do not merely respond to needs for functionality and profitability. What distinguishes a country that wishes to define itself as civilized, advanced, and with great cultural traditions should also be its ability to place works of territorial transformation, both public and private, within an organic framework of progress that is not only economic but also cultural and civil for society. /.../
from the Draft Law under discussion in the Parliamentary Committees.

The protection and enhancement of historic centers, particularly in the picturesque smaller towns of Italy, represents a crucial challenge in the context of cultural heritage conservation. Alongside the numerous initiatives and regulations issued at both the Italian and European levels, as outlined in the previous paragraphs, the promotion of local heritage also includes restoration charters, Italian regulations, guidelines for the protection and enhancement of inhabited centers, and several European directives and conventions.

The Restoration Charters, in particular, are essential documents that outline principles and guidelines for interventions and play a fundamental role in this process, emphasizing the importance of preserving the authenticity and specificity of these places, such as the small inner towns, often composed of dense historic centers rich in history, valuable architecture, culture, and tradition. The Restoration Charters, such as the first and most famous, the Athens Charter of 1931, and the most recent, the Krakow Charter of 2000 (*Fig. 1*), provide a regulatory and ethical framework for the restoration of historic centers. These documents highlight the importance of a careful approach, respectful of the original characteristics, architectural peculiarities, and historical layers present in the villages, avoiding interventions that could compromise their historical and architectural integrity.

In Italy's most authentic smaller towns, the application of the Restoration Charters translates into a thorough analysis of local architectural and cultural characteristics before undertaking any intervention. The goal is to preserve the traditional urban fabric, squares, cobblestone streets, and historic buildings, maintaining the original appearance and environmental context, thereby promoting local identity. The objective is to reconcile conservation with contemporary needs, allowing historic centers to continue living, adapting, and approaching innovation without losing their authenticity.

In many Italian municipalities, the active involvement of residents in the management and preservation of the historic center is a key element in ensuring the success of rehabilitation initiatives, based on the awareness of each place's uniqueness and the desire to preserve collective memory. Through a thoughtful and respectful approach, these places become not only testimonies of the past but also foundations for the future.
Italian legislation for the conservation of cultural heritage has a long history, rooted in the 19th century. In 1882, with Law No. 364, the Superintendence for Monuments and Fine Arts was established to protect and enhance Italy's cultural heritage.

In 1939, with Law No. 1089, the concept of "cultural heritage" was introduced, encompassing immovable and movable properties of historical, artistic, archaeological, ethnographic, archival, and bibliographical interest. The law also established that cultural heritage was subject to protection by the State, which had the right to intervene when necessary.

In 1974, with Law No. 1089, the Superintendence for Environmental and Architectural Heritage was established, tasked with protecting, supervising, and enhancing environmental heritage, that is, immovable properties

1931 | ATHENS CHARTER

It consists of 10 points that, rather than establishing true principles, provide recommendations addressed to the governments of the states, summarized as follows:

1. Care for the heritage;
2. Standardize legislation so that private interests do not prevail over public ones;

Expand the study of art to teach populations to love and respect their architectural heritage.

1932 | ITALIAN CHARTER OF RESTORATION

It affirms principles similar to those of the "Athens Charter," but it also reflects the position expressed in those years by Gustavo Giovannoni, defined as "scientific restoration." He was the first to suggest that every intervention should utilize the most modern technologies in order to achieve scientifically-informed restoration work. It was issued by the Superior Council for Antiquities, under the Ministry of Public Instruction.

1964 | VENICE CHARTER

The Charter consists of 16 articles and brilliantly summarizes the principles that can be considered immutable in the methodology of architectural restoration. It emphasizes, above all, the historical aspect of a building and introduces for the first time the concept of conserving the urban environment surrounding monumental buildings. Roberto Pane, Piero Gazzola, and Cesare Brandi made a fundamental personal contribution to this Charter.

1972 | ITALIAN CHARTER OF RESTORATION

In the 12 articles of the Charter, in which Cesare Brandi's influence is recognized, the objects subject to safeguarding and restoration actions are defined: these actions extend from individual works of art to complexes of buildings of monumental, historical, and/or environmental interest, to historic centers, art collections, furnishings, gardens, parks, and ancient remains discovered in land and underwater excavations. The guidelines provided by the Charter constitute a kind of general regulation for the conservation and restoration of works of art.

1975 | AMSTERDAM CHARTER

Issued by the Council of Europe, the Charter establishes that the conservation of architectural heritage must be one of the primary objectives of urban planning and territorial organization, in an "integrated conservation" perspective that involves the responsibility of local authorities and requires citizen participation and the adjustment of legislative and administrative measures. Integrated conservation is the result of the joint use of restoration techniques and the search for appropriate functions.

1987 | WASHINGTON CHARTER

The Charter is drafted by the International Council on Monuments and Sites (ICOMOS), completing the provisions of the Venice Charter of 1964. It acknowledges that all cities in the world, whether the result of more or less spontaneous development or a specific design, are material expressions of the diversity of societies throughout history and are, for this reason, all historical. The Charter thus envisions itself as an "International Charter for the Safeguarding of Historic Cities." This should be an integral part of a coherent development policy...

2000 | CRACOVIA CHARTER

Promulgated by the European Community as the Charter of Restoration, titled "Principles for the Conservation and Restoration of the Built Heritage," it explicitly states that the concept of "heritage" replaces that of "architectural monument." For this reason, the Charter aims to raise awareness about conservation and maintenance of the entire territory, including unbuilt landscape areas, as the entire territory preserves very important elements of human history and culture.

Fig. I.7.1 | Summary synoptic framework of the Italian Restoration Charters. ©Luisa Lombardo, 2024.

of landscape, historical, artistic, architectural, archaeological, ethnographic, and scientific interest.

In 1999, with Law No. 368, the concept of "enhancement of cultural heritage" was introduced, which included not only protection but also the promotion and enjoyment of cultural heritage. The law also established the creation of a fund for the enhancement of cultural heritage.

In 2004, with Law No. 42, the Code of Cultural Heritage and Landscape was approved, which simplified and rationalized the regulations regarding the protection and enhancement of cultural heritage. The Code also introduced new provisions, such as the possibility of assigning restoration work to private entities through concessions or contracts.

Italian legislation on conservation and restoration has evolved over time, responding to new needs for the protection and enhancement of cultural heritage. In particular, in recent years, there has been a growing interest in the enhancement of cultural heritage, which is increasingly seen as an essential element for its protection.

Historic centers represent an invaluable cultural heritage that testifies to the history and culture of our country. These centers are often characterized by valuable, authentic architecture, making these places unique in the world. However, the historic centers of small villages are also subject to numerous risks, including degradation, abandonment, and mass tourism. To safeguard these centers, coordinated action by institutions is required, based on a solid regulatory foundation and perfect synergy between the fields of rehabilitation and restoration.

The restoration charters and Italian laws play a fundamental role in safeguarding and provide a framework to ensure that these interventions are carried out in compliance with scientific principles and the protection of cultural heritage. These regulations allow for the integration of cultural heritage protection with the enhancement of these places, which represent an important resource for our country.

The study and analysis of the regulatory framework provides a range of interventions and possible actions in well-preserved and protected contexts, such as most of the smaller towns. While focusing exclusively on rehabilitation, such studies are preparatory for understanding territorial dynamics as well as possible actions. In fact, small towns are often located within natural sites recognized worldwide and, in addition to their basic architectural fabric, also possess monumental heritage that makes them unique and important for Italian history.

Fig. I.7.2 | Italian historic centers ©Italia Nostra, 2021

I.7.1 Davos Declaration 2018. A Culture of quality building for Europe

In January 2018, European culture ministers adopted the Davos Declaration titled "Towards a Culture of Quality Construction for Europe." This declaration outlined a strategic and political path to spread and consolidate a culture of high-quality construction. It emphasizes the concept that building is a cultural act that creates space for culture itself. The Davos Declaration has been cited and widely discussed worldwide, becoming a point of reference for states, organizations, institutions, and businesses (Jokilehto J., 2017).

The movement for the culture of construction, following the commitment established by the Davos Declaration, continues on a strategic, political, and scientific level. It aims to deepen scientific reflection on fundamental concepts and clarify the key terms of the declaration. At the same time, it promotes political strategies that recognize the cultural value of conservation, land planning, and construction, with the primary goal of creating a culture of quality construction (Cleere H. & ICOMOS, 2002). Various international initiatives associated with this process are consolidated under the name of the "Davos Process." In small towns that preserve unique heritage and construction traditions, it is imperative to talk about quality.

The culture of construction is defined as an approach that considers the built environment as a whole, embracing aspects ranging from building substance to contemporary production, from artisanal details to buildings and open spaces, to large infrastructures. The definition of "quality construction culture" remains a subject of debate, but numerous initiatives have been promoted to improve the quality of the built environment.

The Davos System for Quality in the Culture of Construction was developed to assess the qualities of places through eight fundamental criteria: *governance*, functionality, environment, economy, diversity, context, genius loci, and beauty (*Fig. 1*). This tool is useful in planning, projects, competition evaluations, or participatory processes. It is designed to consider and weigh social, emotional, and cultural values alongside technical and functional aspects.

The Davos System evaluation module includes a series of questions for each of the eight criteria, adaptable to the specific characteristics of places or projects. The responses allow the determination of the actual quality level of a place, highlighting strengths and weaknesses.

The Swiss Foundation for the Culture of Construction responded cautiously to the first version of the Davos System, criticizing it as a "technocratic approach" that could "corrupt the essence of Baukultur." However, the Davos System aims to overcome divisions between disciplines and engage citizens in the dialogue on quality in construction. It also seeks to balance the authority of professionals in judgments through its use in competitions and bidding processes.

The challenge is to allow the emergence of a "discourse on quality" that involves not only a predetermined jury but also citizens and professionals outside narrow circles. The goal is to stimulate reflection on the quality of the built environment, seeking to involve designers, citizens, and professionals in the dialogue.

The overall evaluation of the Davos System could produce heterogeneous results, influenced by the perspective of the evaluator, which could be the mayor of a small town, as in the case of Italian villages or towns, or an architect. The aim is to initiate independent reflection, allowing each person to ask questions about quality, evaluating their own context and position. Benchmarking and the definition of indicators for each criterion are expected in a later phase.

I.7.1.1 Definition of construction culture

The anthropic environment is part of our daily life, so it is essential to promote a culture of high-quality construction for our overall well-being.

Construction culture embraces the anthropic environment in its entirety, considering it as an integrated whole: from the building substance to contemporary production; from small artisanal details to buildings and open spaces, extending to include large infrastructures; from the design phase to the construction phase, from commissioning to reuse, and finally, also considering the landscape. In fact, the precise definition of what falls under the category of "quality construction culture" remains a topic of debate (Forster K., 2018).

Numerous initiatives have been undertaken with the aim of improving the overall quality of the anthropic environment. These initiatives range from detailed artisanal activities to the construction of buildings, the creation of open spaces, and the implementation of large infrastructures. In this way, the promotion of a high-quality construction culture aims to optimize every phase of the process, from ideation to reuse, thus contributing to the creation of a more sustainable and rewarding anthropic environment.

A culture of high-quality construction is reflected in cities, villages, and buildings conceived and built according to excellence criteria. These quality places contribute to creating a pleasant living environment, promoting the well-being and health of individuals. The Davos System for quality in construction culture was developed to provide the possibility to evaluate the qualities of places through eight fundamental criteria. Its utility also extends to the planning and design phase, the evaluation of competitions, or in participatory processes. What makes this system unique is its ability to integrate social, emotional, and cultural values with technical and functional aspects, just as it should be for territorial development.

Developed in collaboration with international partners by the Swiss Federal Office of Culture, the Davos System for quality in construction culture actively contributes to the Davos Process, initiated in 2018 with the adoption of the Davos Declaration, integrating existing tools and committing to preserve and develop diverse places distinguished by a culture of high-quality construction, also considering three fundamental criteria such as *Firmitas, Utilitas, Venustas*[1]. However, the modern approach stimulates reflection on various projects, multiplying perspectives and encouraging a broader vision.

Moreover, the Davos System proposes measuring projects by assigning a score for each category to evaluate them overall. The final evaluation of a project is determined by the average of these scores. According to sociologist Steffen Mau[2], quantification could lead to a simplification of the criteria and polarization in favor of those that can be expressed numerically.

[1] Since the time of Vitruvius, three judgment parameters were necessary to grant a construction the title of "architecture": Firmitas (static and material solidity), Venustas (aesthetic beauty, usually defined by proportions), and Utilitas (functional utility). The concept of beauty in a work is certainly subjective, especially influenced by a particular school of thought; static stability is essential, without it we would be surrounded by buildings that collapse and cease to exist within a few years. But what about functional utility? In reading, we would say that, like firmitas, it is an essential element for the use of a building, as every architecture is designed based on a specific function, and without it, the need for the construction would cease to exist. Reflecting on the projects of great masters, one can get lost in the sea of meanings attributed to them by historians or history itself, but if we pause to think, we can observe how often the functionality, or better yet, the livability of the works, is severely challenged by the translation of ideas into buildings. This is how the perfection given by lines and proportions is spoiled by a too-steep staircase, leaks, or materials poorly suited to the place. (Valentina Guidi, 2012)

[2] Steffen Mau, https://ces.fas.harvard.edu/people/steffen-mau (last accessed on 22.12.2023)

Fig. I.7.1.1 | The Davos Declaration ©Widgers We Forum, 1988.

Davos
"baukultur"

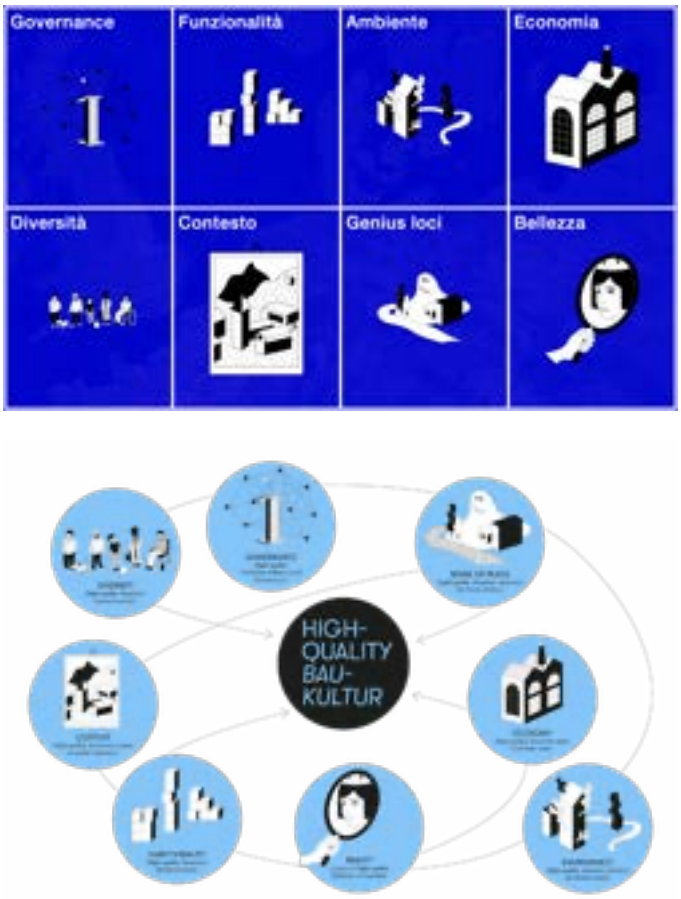


Fig. I.7.1.1.1 | Davos System for Quality in the Culture of Construction. Eight criteria for a quality construction culture. ©Davos Declaration, 2018.

I.7.2 ICOMOS - Historic Cities and Villages

ICOMOS, the International Council on Monuments and Sites, is an international non-governmental organization and advisory body of UNESCO, with the primary mission of promoting the conservation, protection, use, and enhancement of monuments, built complexes, and sites of historical and cultural significance.

The issue of smaller towns plays a crucial role in the development of Italian society, especially considering the acceleration and revival that occurred following the pandemic, which prompted a trend of abandonment of large metropolitan areas in favor of small municipalities, aimed at ensuring a better quality of life.

ICOMOS CIVVIH[1] has actively contributed to the integrated urban conservation of historic cities and villages internationally over the years. A significant step in this direction is the drafting of the "Valletta Principles for the Safeguarding and Management of Historic Cities and Urban Areas" (ICOMOS CIVVIH Charter 2011). In 2020 and 2021, ICOMOS focused its attention on enhancing the rich cultural, material, and immaterial heritage of villages and small towns, emphasizing the need for their regeneration and valorization (Smith L., 2018).

In this context, the theme of Law No. 158 of 2017, commonly known as the "Save the Villages Law" (further discussed in the next section), was explored, aiming to encourage an improved proposal for its application and ensure its full enforcement. At such a crucial time, when it is necessary to synthesize the various strategic projects launched in the past, ICOMOS intends to offer its expertise. This includes analyzing *best practices* carried out locally, as well as documenting the challenges encountered (Avrami E. & ICOMOS, 2000).

ICOMOS CIVVIH intends to establish an Observatory on the most interesting activities developed by local communities, with the goal of identifying concrete proposals that can lead to improvements in the current situation. The ultimate goal is to contribute to Italy's effective use of Next Generation EU resources to implement regeneration projects for small towns, safeguarding and enhancing the natural, rural, historical-cultural heritage and ancient local traditions[2].

To combat depopulation, the adoption of new operational tools is hoped for, such as a system of essential services (education, healthcare, and transportation) and technological innovation (broadband), within a framework of sustainable development. This requires directing funds towards a proper intervention line for regeneration and valorization in public interest operations (Choay F., 2001).

For this to happen effectively, it is imperative to define and share future action priorities, encouraging the construction of a new, expanded territorial vision. This implies the involvement of local administrations and public authorities, the main beneficiaries, in defining common ideas to guide spending according to agreed guidelines. Moreover, it is crucial to prevent funds from being directed towards privatized operations of personal interest, instead promoting interventions that contribute to the common good and strengthen the capabilities and skills of the staff and organizations involved. The idea of *Smart Villages* is, therefore, at the core of ICOMOS.

[1] ICOMOS CIVVIH, the acronym for the International Committee on Historic Towns and Villages, is a non-governmental organization affiliated with ICOMOS (International Council on Monuments and Sites). Its main mission is dedicated to promoting the integrated conservation of historic towns and villages at the international level. Key aspects of ICOMOS CIVVIH include: promoting the conservation and sustainable management of historic towns and villages; encouraging the exchange of experiences and knowledge among professionals in the field; developing tools and guidelines for urban conservation;
Raising public awareness about the importance of urban historical heritage.
It organizes conferences, workshops, and seminars aimed at discussing and deepening topics related to urban conservation. The organization publishes studies and research on urban conservation to contribute to the dissemination of knowledge in the field. It actively collaborates with public and private entities to implement concrete projects focused on the conservation of urban historical heritage. ICOMOS CIVVIH also develops standards and guidelines for managing historic centers, providing a regulatory framework to guide conservation actions. Among its key documents is the "Valletta Principles for the Safeguarding and Management of Historic Cities and Urban Ensembles" (ICOMOS CIVVIH Charter, 2011). This document serves as a fundamental pillar, defining guiding principles for the conservation and sustainable management of historic towns and villages. The Charter provides a conceptual framework for conservation practices and is an important reference for sector experts.

[2] The concept of "integrated conservation," widely recognized at the global level (UNESCO, ICOMOS, ICCROM, Council of Europe, etc.), highlights all the individual values, united in their complexity and protected in their unity-identity as a whole, which constitutes urban value. Urban value that is often subject to "risk." That is, all that the historic city can lose in the event of a natural disaster, not excluding other risks to which urban settlements of ancient origin are subject, such as environmental risks (pollution, etc.) and anthropic risks (wars, etc.). Among the risks, today, we must also consider those of tourism pressure and the distorted use of urban heritage with the well-known phenomenon, highlighted by Françoise Choay, of the current "cultural industry" (from Teresa Colletta, Il valore urbano, 2005).

I.7.3 "Salva Borghi" Law

Returning to Italy, the "Salva Borghi" Law No. 158/2017 – Small Municipalities was conceived to promote and facilitate the sustainable development—economic, social, environmental, and cultural—of small municipalities. This legislation aims to maintain demographic balance in the country by encouraging residence in these communities and protecting and enhancing their natural, rural, historical-cultural, and architectural heritage (Romano F., 2022). The law promotes specific measures to support residents in small municipalities and the local productive activities, with particular attention to the system of essential services. The main goal is to combat depopulation in these areas and encourage tourist influx (Dalla Zuanna G., 2022).

Key features include:

- **beneficiaries:** Municipalities with a population of up to 5,000 inhabitants or municipalities formed following a merger, each with a population of up to 5,000 inhabitants;
- **type of funding:** 100% grant (non-repayable);
- **financial allocation:** 160 million euros until 2023;
- **opening of the call:** The call is expected to open by the end of the year, once the final implementation measures for granting the contribution are defined.

Settling in small municipalities is considered a crucial resource for preserving the territory, especially for activities aimed at combating hydrogeological instability and for the widespread maintenance of common goods (De Bernardi A., 2021). The law identifies small municipalities as those with a resident population of up to 5,000 inhabitants, including municipalities formed following the merger of municipalities with a population of up to 5,000 inhabitants. Priorities for interventions in small municipalities include:

- qualification and maintenance of the territory, with rehabilitation and redevelopment of existing buildings and abandoned areas, as well as actions aimed at reducing hydrogeological risk;
- safety and redevelopment of road infrastructure and public buildings, with particular attention to schools, early childhood centers, and social-care facilities;
- improving energy efficiency of public building stock and promoting renewable energy production and distribution systems;
- acquisition and redevelopment of abandoned land and buildings to support youth entrepreneurship and initiate new tourist and commercial activities;
- acquisition of former tollhouses and disused railway land, with the aim of developing cycle paths and promoting tourism enhancement;
- urban redevelopment of historic centers, with particular attention to ancient villages and abandoned or depopulated historic centers;
- rehabilitation of cultural, historical, artistic, and library assets;
- rehabilitation of mountain pastures to support the production of high-quality meats and cheeses.

The law includes specific articles, such as the establishment of a Fund for the structural, economic, and social development of small municipalities, funding for the protection of the environment and cultural assets, measures to counter the abandonment of properties, promotion of distributed hotels, development of ultra-fast broadband networks, and promotion of local products through short supply chains and zero-kilometer production: a fundamental tool for preserving and enhancing the heritage of rural communities, supporting their growth and attractiveness (Caciagli M., 2020).

Fig. I.7.3.1 | Civita Bagnoregio, the dying city. ©GoGuides, 2020.

I.7.4 FOSMIT - Fund for the development of Italian mountain areas

On September 18, 2024, a call for proposals of 19 million euros was announced for the mountain and partially mountain municipalities of Sicily (D.A. n.367/Serv. 6 of 18.09.2024), funded by the Fund for the Development of the Italian Mountains (Fosmit), with resources allocated by the Presidency of the Council of Ministers to the Sicilian Region.
Among these, many are part of the Madonie district and other inner areas that will be analyzed in detail in the following chapters. The participating municipalities include: Scillato, Sclafani Bagni, Valledolmo, San Mauro Castelverde, Pollina, Polizzi Generosa, Petralia Soprana, Petralia Sottana, Montemaggiore Belsito, Isnello, Gratteri, Geraci Siculo, Gangi, Collesano, Castelbuono, Caltavuturo, Caccamo, Aliminusa, and Alimena.

The call aims to support initiatives for the enhancement and promotion of mountainous areas, strengthening local social networks, reducing depopulation, and improving the attractiveness of these fragile territories. The eligible areas for funding include:

- **informatization:** projects for digital literacy and inclusion, aimed at stimulating the use of the web and promoting digital participation of the population;
- **instrumental assets:** acquisition of tools to improve essential services in municipalities;
- **heritage enhancement:** promotion and redevelopment of existing heritage, both material and immaterial, in order to increase tourism and cultural attractiveness;
- **energy efficiency:** targeted interventions to reduce dependence on fossil energy sources in the medium and long term and to improve the energy efficiency of public infrastructures;
- **road maintenance:** ordinary and extraordinary maintenance interventions of municipal and inter-municipal roads, essential to improve inner mobility and connectivity between different mountain areas.

The current regional councilor for Local Autonomies and Public Administration, Andrea Messina, emphasized that this call for proposals is the result of intense coordination work between various regional departments and the Basin Authority to recover national funds that would have been lost. Messina reiterated that the 19 million euros recovered represent a concrete commitment from the regional government to support and develop mountain municipalities, giving local administrations the freedom to present projects in areas of significant importance for promoting their territories.

The main objective of the call is to strengthen the attractiveness of these vulnerable areas and reduce the risk of depopulation. This will be achieved through the enhancement of social networks and the promotion of cultural, environmental, and infrastructural heritage. This approach aligns with the concept of "Roots Tourism," which promotes a tourism offer linked to the memory of places, particularly focusing on local values and historical traditions.

The municipalities involved must submit their projects, with details and cost estimates, within 45 days from the publication of the notice in the Official Gazette of the Sicilian Region. Each project must be approved by the local council before submission, under penalty of exclusion from the call. To facilitate participation and explain the details of the measure, two operational meetings with mayors and municipal technicians will be held in the coming days in Palermo and Catania. These meetings will aim to provide all necessary information for the proper submission of projects.
The general objectives of the call are:

- strengthen the infrastructure and essential services of mountainous areas, as well as improve roadways through ordinary and extraordinary maintenance of municipal and inter-municipal roads;
- promote digital transition and the use of technologies for social inclu-

[1] Il Root tourism represents a growing phenomenon involving millions of Italian descendants around the world, offering them the opportunity to rediscover their origins and reconnect with the land of their ancestors. The year 2024, declared the Year of Italian Roots by the Ministry of Foreign Affairs and International Cooperation, presents a key opportunity to promote small Italian villages, such as Castelsaraceno, which are preparing to welcome these "returning tourists." These places, rich in authenticity, offer visitors not only the chance to immerse themselves in local traditions and culture but also to rediscover traces of their family history.

The concept of root tourism is inspired by the "rooting" process, similar to the regenerative ability of plants to root and thrive over time, even in adverse conditions. This type of tourism interests Italians who emigrated and their descendants, who left Italy between the 19th and 20th centuries in search of new opportunities. It is estimated that about 80 million Italian descendants reside in countries such as Argentina, Australia, Brazil, the United States, and Canada, many of whom embark on a journey to reconnect with their places of origin.

In this context, root tourism also becomes a tool for the de-seasonalization of tourism, offering villages like Castelsaraceno an opportunity for sustainable growth and development.

"Root Tourism" is a structured tourism offering through appropriate communication strategies, combining the proposal of third-sector goods and services (accommodation, food and wine, guided tours) with the knowledge of family history and the culture of origin of Italians residing abroad and Italian descendants, who, it is worth mentioning, are estimated to be part of a target audience of nearly 80 million people.

In 1997, ENIT categorized 5.8 million travelers visiting Italy as "Root Tourists." In 2018, eleven years later, this number had increased to 10 million (+72.5%).

In 2018, the economic flow generated by Root Tourism was approximately 4 billion euros (+7.5% compared to the previous year). Source: Ministry of Foreign Affairs and International Cooperation. (2024). Root Tourism. https://www.esteri.it/it/servizi-consolari-e-visti/italiani-all-estero/turismo-delle-radici/

sion;
- enhance natural and cultural heritage;
- reduce dependence on fossil energy sources and promote more sustainable use of resources;
- combat depopulation by improving the quality of life in mountainous areas.

The call represents a response to the challenges of depopulation and marginalization faced by the Sicilian mountain areas, offering an opportunity to stimulate their economic, social, and tourism development.

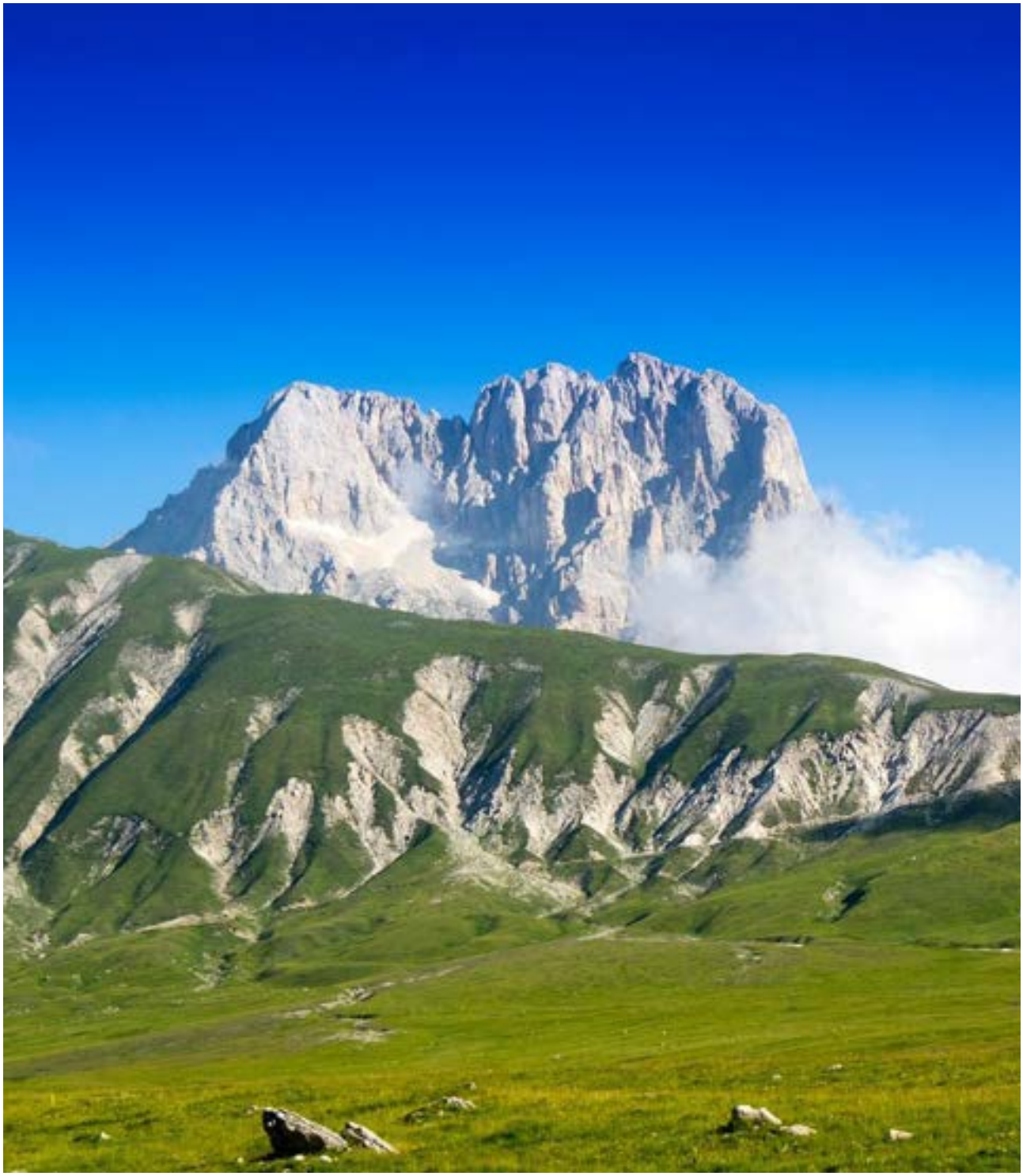


Fig. I.7.4.1 | The Gran Sasso d'Italia, in Abruzzo, the highest mountain massif of the Apennines. ©Meteored, 2024.

THEY SAY ABOUT THE ITALIAN INNER AREAS

“

The inner areas are an invaluable heritage of our country, but also a fragile and often forgotten area. We must work to bridge the gap between these areas and the rest of the country, investing in infrastructure, services, and economic development.

Giuseppe Conte,
Prime Minister (2018-2021)

“

The inner areas are a hidden Italy, but also a living Italy. We must enhance these areas, making them attractive for young people and businesses.

Matteo Renzi,
President of the Council of Ministers (2014-2016)

“

The inner areas are a mosaic of landscapes, cultures, and traditions. They are a heritage to protect and enhance, but also an opportunity for sustainable development.

Giuseppe Dematteis,
Italian geographer

“

The inner areas are an Italy that is not seen, but is alive and thriving. We must invest in these areas to make them protagonists of our development.

Enrico Letta,
President of the Council of Ministers (2013-2014)

“

The inner areas are an opportunity for our country. They are rich in history, culture, and nature, but also in human resources. We must invest in these areas to make them a driving force for economic and social development.

Maria Elena Boschi,
Minister for Constitutional Reforms and Simplification (2014-2016)

“

The inner areas are a separate Italy, an Italy that has not been able to keep pace with the development of the rest of the country. We must reverse this trend by investing in these areas to make Italy more united and prosperous.

Fabrizio Barca,
Italian economist and politician

“

The inner areas are an Italy to be repopulated. We must reverse the trend of abandonment in these areas by creating job and life opportunities for young people.

Emanuele Massetti,
Italian economist

“

The inner areas are a forgotten Italy, but one that has so much to offer. We must enhance these areas, making them an opportunity for everyone.

Pier Luigi Bersani,
President of the Council of Ministers (2013)

“

The inner areas are a part of Italy rich in history, culture, and nature. We must invest in these areas to make them a model of sustainable development.

Silvio Berlusconi,
President of the Council of Ministers (2001-2006 and 2008-2011)

“

The inner areas are a social and cultural laboratory. They can offer an alternative development model, based on sustainability and the enhancement of local resources.

Massimo Bricocoli,
Italian sociologist

“

The inner areas are an opportunity for the economic and social development of the country. We must invest in these areas to create job and life opportunities for young people.

Luca Salvati,
Italian economist

“

The inner areas are a vibrant and resilient Italy. They can offer an innovative development model based on participation and cooperation.

Annalisa Colombi,
Italian anthropologist

“

The inner areas are a crossroads of cultures and traditions, a heritage to be protected and enhanced.

Paolo Cognetti,
Italian writer

“

The inner areas are an Italy that is not afraid to change, looking to the future with optimism.

Davide Cassani,
Italian cyclist

“

The inner areas are an Italy that has so much to offer, but is often forgotten. We must commit to making them known and appreciated.

Paola Severino,
Italian jurist

“

The inner areas are a valuable resource for our country. We must invest in these areas to make them a driver of sustainable and inclusive development.

Mario Draghi,
President of the Council of Ministers (2021-2022)

“

The inner areas are an authentic Italy, with much to offer. We must enhance these areas, making them an attraction for tourists and investors.

Luigi Di Maio,
Minister of Foreign Affairs and International Cooperation (2018-2021)

“

The inner areas are a heritage to be defended and enhanced. We must commit to ensuring these areas have the same opportunities as the rest of the country.

Giorgia Meloni,
Prime Minister (2014-in power)

“

The inner areas are an ancient Italy, preserving its traditions and culture. We must preserve this heritage, which is a lifeline for our country.

Giuseppe Tomasi di Lampedusa,
Italian writer

“

The inner areas are a hidden Italy, but one that is rich in beauty and magic. We must rediscover these areas, which can offer us new perspectives on life.

Paolo Rumiz,
Italian journalist and writer

“

The inner areas are a different Italy, one that can offer us an alternative development model, based on sustainability and solidarity.

Francesco Remotti,
Italian anthropologist

“

The inner areas are an Italy that resists, that does not give up in the face of difficulties.

Fabrizio De Andrè,
Italian singer-songwriter

“

The inner areas are an Italy that needs us, a concrete commitment for its development.

Giovanni Paolo II,
Pope

“

The inner areas are an Italy that speaks to us, telling us its history and culture.

Carlo Petrini,
Slow Food Founder

“

The inner areas are an Italy that must be made more inclusive and accessible. We must invest in these areas to ensure that children and young people have the same opportunities as the rest of the country.

Stefania Craxi,
President of the Parliamentary Commission for Childhood and Adolescence (2022-in power)

“

The inner areas are an Italy to be repopulated. We must reverse the trend of abandonment in these areas, creating job and life opportunities for young people.

Emanuele Massetti,
Italian economist

“

The inner areas are a vibrant and resilient Italy. They can offer an innovative development model based on participation and cooperation.

Annalisa Colombi,
Italian anthropologist

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For further details on the Case Studies analyzed,
please refer to Appendix n°1.

Case Study Booklet

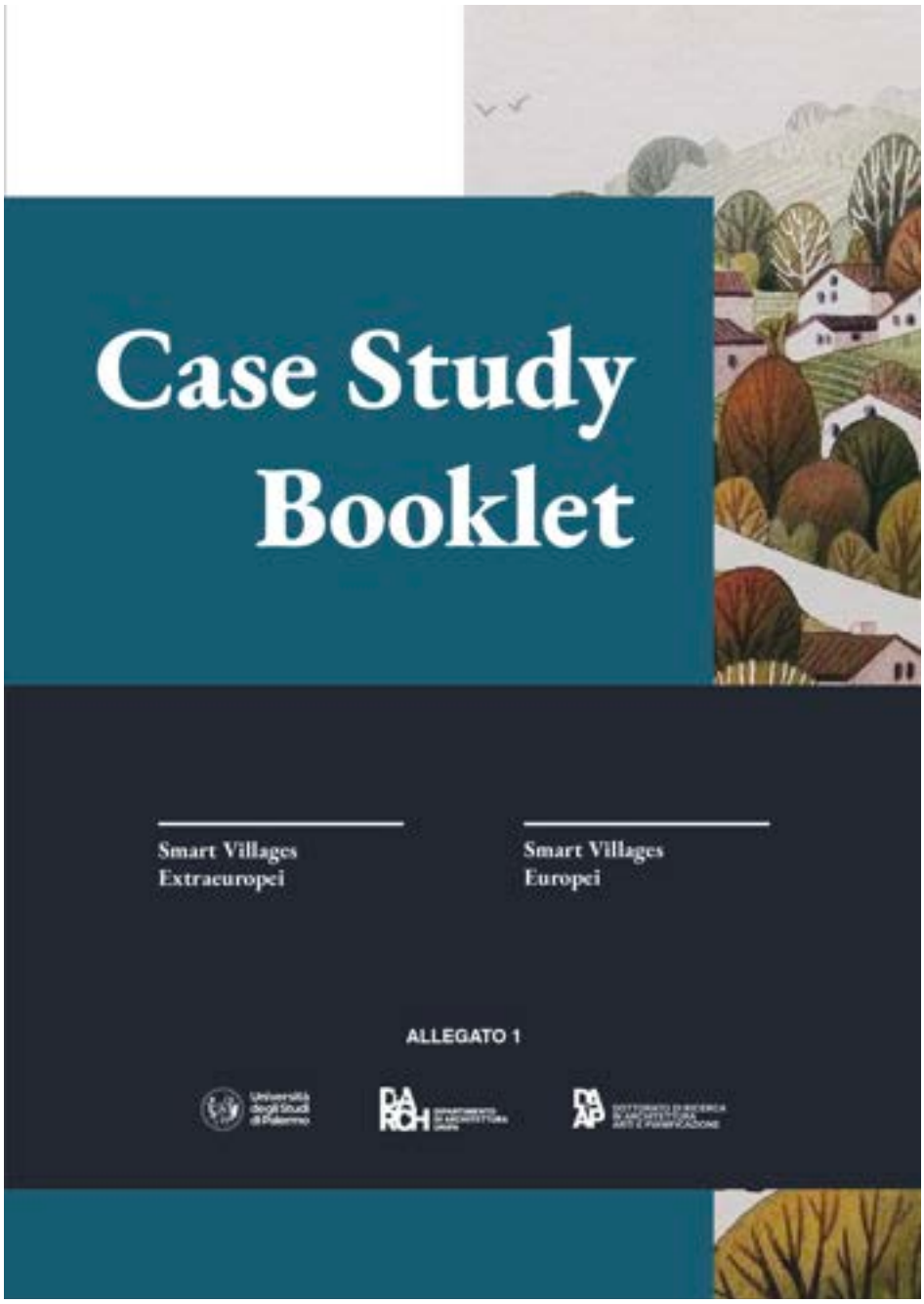

Fig. II | Municipality of Gangi © Carmelo Di Salvo, 2021

Chapter II

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Chapter II
Abstract

IT

Il secondo capitolo della presente tesi si concentra sull'analisi approfondita del caso studio di riferimento, focalizzandosi sull'area del Parco delle Madonie, un Geopark UNESCO in Sicilia che abbraccia 21 comuni dell'area del palermitano. Attraverso un'analisi SWOT, il capitolo mira a individuare le potenzialità e le minacce intrinseche a questo territorio, ponendo le basi per la definizione di strategie innovative di sviluppo sostenibile.

Il contesto si arricchisce con la scelta di un caso pilota di concerto con la Soprintendenza ai Beni Culturali e Ambientali della Provincia di Palermo per la sua condizione di estrema marginalità e, proprio per tale motivo, caso emmblematico da analizzare con tutte le sue peculiarità, il Comune di Polizzi Generosa, selezionato in virtù della convenzione esistente tra il Dipartimento di Architettura e il Comune stesso. Questa collaborazione mira al recupero e alla valorizzazione del territorio, nonché alla progettazione sostenibile e tecnologica di soluzioni innovative. L'analisi dettagliata di questo caso offre un quadro pratico e concreto delle sfide e delle opportunità che possono emergere nella realizzazione di un villaggio intelligente.

Il capitolo procede presentando l'esperienza di tirocinio presso la Soprintendenza BB.CC.AA. della Provincia di Palermo, l'ente responsabile della tutela del territorio oggetto di studio. Questa esperienza fornisce una visione privilegiata delle dinamiche di tutela e sorveglianza che contribuiscono alla salvaguardia dei luoghi e alla promozione di pratiche di sviluppo sostenibile. Ulteriormente, si rende conto dell'esperienza all'estero, parte integrante del progetto di ricerca assegnato. Questa esperienza ha portato alla conoscenza dei principi di tutela che regolamentano le aree interne valenciane, oltre allo studio di villaggi selezionati in collaborazione con la Real Academia de Belle Artes de San Carlos de Valencia e l'UPV - Universitat Politecnica de Valencia. Questa prospettiva internazionale consente un confronto costruttivo e arricchisce la comprensione delle *best practices* globali e della loro possibile adattabilità al contesto siciliano.

In conclusione, il capitolo 2 si configura come un tassello cruciale nell'analisi di un contesto specifico e nella raccolta di esperienze pratiche che alimentano il percorso di ricerca e sviluppo per la creazione di *Smart Villages* nelle aree interne siciliane.

EN

The second chapter of this thesis focuses on an in-depth analysis of the reference case study, centering on the Madonie Park area, a UNESCO Geopark in Sicily encompassing 21 municipalities in the Palermo region. Through a SWOT analysis, this chapter aims to identify the strengths, weaknesses, opportunities, and threats inherent to this territory, laying the groundwork for the definition of innovative strategies for sustainable development.

The context is enriched by the selection of a pilot case, in collaboration with the Superintendence for Cultural and Environmental Heritage of the Province of Palermo, chosen for its condition of extreme marginality. Precisely for this reason, the selected case, the Municipality of Polizzi Generosa, represents an emblematic subject of analysis with all its unique characteristics. This municipality was chosen under an existing agreement between the Department of Architecture and the local administration. The collaboration aims to recover and enhance the territory while fostering the sustainable and technological design of innovative solutions. A detailed analysis of this case provides a practical and concrete framework for understanding the challenges and opportunities involved in the creation of a Smart Village.

The chapter further presents the internship experience at the Superintendence for Cultural and Environmental Heritage of the Province of Palermo, the authority responsible for safeguarding the territory under study. This experience offers privileged insight into the dynamics of preservation and monitoring, which contribute to the protection of the area and the promotion of sustainable development practices. Additionally, the research project includes an international component, which has allowed for the study of conservation principles governing the Valencian inner areas. This was carried out through the analysis of selected villages in collaboration with the Royal Academy of Fine Arts of San Carlos in Valencia and the Polytechnic University of Valencia (UPV). This international perspective enables constructive comparisons and enhances the understanding of global best practices and their potential adaptability to the Sicilian context.

In conclusion, Chapter 2 serves as a critical cornerstone for the analysis of a specific context and the collection of practical experiences, which support the research and development pathway for creating Smart Villages in Sicily's inner areas.

ES

El segundo capítulo de esta tesis se centra en un análisis profundo del caso de estudio de referencia, enfocado en la zona del Parque de las Madonie, un Geoparque UNESCO en Sicilia que abarca 21 municipios de la región de Palermo. A través de un análisis FODA, este capítulo tiene como objetivo identificar las fortalezas, debilidades, oportunidades y amenazas inherentes a este territorio, sentando las bases para la definición de estrategias innovadoras de desarrollo sostenible.

El contexto se enriquece con la selección de un caso piloto, en colaboración con la Superintendencia de Bienes Culturales y Ambientales de la Provincia de Palermo, elegido por su condición de extrema marginalidad. Precisamente por esta razón, el caso seleccionado, el Municipio de Polizzi Generosa, representa un ejemplo emblemático de análisis, con todas sus peculiaridades. Este municipio fue seleccionado en virtud de un convenio existente entre el Departamento de Arquitectura y la administración local. La colaboración tiene como objetivo la recuperación y valorización del territorio, así como el diseño sostenible y tecnológico de soluciones innovadoras. Un análisis detallado de este caso ofrece un marco práctico y concreto para comprender los desafíos y oportunidades involucrados en la creación de un pueblo inteligente.

El capítulo también presenta la experiencia de prácticas realizada en la Superintendencia de Bienes Culturales y Ambientales de la Provincia de Palermo, la entidad responsable de la protección del territorio objeto de estudio. Esta experiencia proporciona una visión privilegiada de las dinámicas de tutela y vigilancia que contribuyen a la salvaguarda de los lugares y a la promoción de prácticas de desarrollo sostenible. Además, el proyecto de investigación incluye una componente internacional que permitió el estudio de los principios de conservación que rigen las áreas interiores valencianas. Esto se llevó a cabo mediante el análisis de pueblos seleccionados en colaboración con la Real Academia de Bellas Artes de San Carlos de Valencia y la Universitat Politècnica de València (UPV). Esta perspectiva internacional permite realizar comparaciones constructivas y enriquece la comprensión de las mejores prácticas globales y su posible adaptabilidad al contexto siciliano.

En conclusión, el Capítulo 2 se configura como un pilar fundamental en el análisis de un contexto específico y en la recopilación de experiencias prácticas que respaldan el camino de investigación y desarrollo para la creación de pueblos inteligentes en las áreas interiores de Sicilia.

THE INNER AREAS OF SICILY AND THE MADONIE REGION. TOWARDS THE CREATION OF A *SMART VILLAGES* NETWORK

The methodological approach adopted to understand territorial dynamics in Sicily, particularly in the Madonie region, required an in-depth exploration of the island's most vulnerable areas, with a specific focus on the territorial and socio-economic challenges they face. The starting point involved identifying and analyzing these vulnerable areas through a detailed evaluation of geographic, socio-economic, and environmental data aimed at pinpointing those most exposed to various difficulties, including economic ones.

To define inner areas, precise criteria were employed, considering not only geographic aspects but also socio-economic dynamics. The boundaries of these zones were mapped based on the presence of inhabited centers, predominant economic activities, and environmental characteristics, enabling a clear representation of the core of Sicilian territory and the complexities that characterize it (De Montis et al., 2020), as outlined in previous strategies.

A key phase of this study involved the geographical analysis of inner areas, including detailed mapping of elements such as territorial morphology, natural resource availability, and accessibility via road networks and public transportation. This analysis highlighted the relationship between physical geography and socio-economic challenges, providing a comprehensive picture of territorial variables. This focus stems from the recognition that the National Strategy for Inner Areas (SNAI) has not always equally valued the municipalities involved and rural areas, often prioritizing quantitative indicators while overlooking essential qualitative data needed to fully describe the reality of these territories (Armiero, 2021).

In this context, Sicily stands out with its numerous marginal areas, which, according to ISTAT data, account for approximately 70% of the island's territory. The focus on Sicily reflects the importance of adapting national strategies to local specificities by revising inclusion criteria and broadening the analysis to encompass other marginal areas to better address the needs of these communities (Ciampa et al., 2020).

Sicilian inner areas represent the island's most remote zones, characterized by low population density and, for this reason, included in the National Strategy for Inner Areas (SNAI) since 2015. For the 2014-2020 and 2021-2027 programming periods, these areas include Calatino, Nebrodi, Sicani, Valle del Simeto, and Madonie[1], as they are invaluable and deserve proper revival and enhancement. Specifically (see *Fig. 1*):

The Calatino is a mountainous region located in southwestern Sicily. It is one of the island's most pristine and untamed areas, home to a rich variety of flora and fauna. The mountains are crisscrossed by numerous hiking trails, offering spectacular views of the valleys and surrounding towns. Some of the most notable towns in the Calatino are Caltagirone, Mazzarino, Gela, Vittoria, Acate, Santa Croce Camerina, Ragusa, Modica, Ispica, Pozzallo, and Comiso.

The Nebrodi are a mountain range located in the northern part of Sicily. They are one of the island's most untouched and pristine areas, home to a rich variety of flora and fauna. The mountains are crisscrossed by nume-

[1] The National Strategy for Inner Areas (SNAI), launched during the 2014-2020 programming cycle, was designed to counteract the demographic decline affecting a significant portion of the country. It aims to ensure full access to essential citizenship rights (local public transport, education, and social and healthcare services) while fostering economic development. It is defined as a territorial strategy supported by national resources, primarily directed toward essential services, and by European funds (ERDF, ESF, and EAFRD) to finance local development projects. During the 2014-2020 cycle, 72 inner areas were selected. In Sicily, and specifically for the Madonie area, a total of €12.7 million was allocated for investments in Transport and Mobility, Digital Networks and Services, and, finally, Culture and Tourism. However, no funding was allocated for Research and Innovation, Business Competitiveness, Energy, Environment, Employment, or Labor. The investment primarily focuses on purchasing goods and services, with the majority directed toward infrastructure, which remains the main constraint for accessing these areas, particularly the Higher Madonie.
[OpenCoesione. (n.d.). Area Interna Sicilia Regione. https://opencoesione.gov.it/it/dati/strategie/AI/sicilia-regione/]

rous hiking trails that offer spectacular views of the valleys and surrounding towns. Some of the most important towns in the Nebrodi area include Capo d'Orlando, Patti, Mistretta, Sant'Angelo di Brolo, Santo Stefano di Camastra, Troina, Randazzo, and Bronte.

The Sicani are a mountainous region in southwestern Sicily. They are the oldest mountains on the island and host a series of archaeological sites dating back to prehistoric times. The Sicani are also a popular destination for nature enthusiasts, thanks to their breathtaking landscapes and rich biodiversity. Some of the most important towns in the Sicani area include Caltanissetta, Enna, Agrigento, Nicosia, Serradifalco, Milena, and Pietraperzia.

The Simeto Valley is located in the eastern part of Sicily. It is one of the island's most fertile areas, hosting a rich variety of crops, including vineyards, olive groves, citrus orchards, and cereals. The valley is traversed by the Simeto River, the longest river on the island. Some of the most important towns in the Simeto Valley include Catania, Paternò, Misterbianco, Belpasso, Adrano, Biancavilla, Gravina di Catania, and Lentini.

Finally, the Madonie Mountains, the focus of this research, are another mountain range located in northern Sicily. While they are not as tall as the Nebrodi, they are no less beautiful. The mountains are rich in woods, forests, and lakes, and host a variety of wildlife, including deer, roe deer, foxes, and wild boars. The area is also a popular destination for winter sports, thanks to its numerous ski slopes in the Piano Battaglia plateau, the mountain of choice for the people of Palermo.

These are just a few of the many wonders found within Sicily's five inner areas (Bagnasco, 1977). These places offer a fascinating glimpse into authentic Sicilian life and provide a unique opportunity to immerse oneself in nature, experience local culture, and meet people who are often genuine and hospitable. In addition to the areas mentioned above, new areas[2] were added in the subsequent programming cycle, considered marginal or at risk, including Corleone, Troina, Bronte, Val Demone, Val Belice, and Val di Mazara.

In 2022, a special project was introduced for Italy's smaller islands, involving 35 municipalities in total. In Sicily, the SNAI special project also includes the islands (SNAI Programming 2021-2027), particularly:

- **Pelagie archipelago** (the islands of Lampedusa and Linosa);
- **Aeolian Archipelago** (the islands of Lipari, Salina, Vulcano, Stromboli, Panarea, Alicudi, and Filicudi);
- **Egadi Archipelago** (the islands of Favignana, Levanzo, and Marettimo).

These selected areas are characterized by a strong tourism vocation but are also among the most remote and sparsely populated regions of Sicily. Due to their decentralization, they are considered marginal; for instance, these areas experience significant depopulation during the winter, or low

Fig. II.1 | Sicilian Inner Areas according to SNAI. ©Luisa Lombardo, 2023.

[2] The project areas for the 2021–2027 programming cycle include:

- the 56 new areas for 2021–2027, which collectively involve 764 municipalities (as of 2020) with a population of 2,056,139;
- the 37 areas identified in 2014–2020 that have been confirmed without any changes to their original boundaries. These encompass 549 municipalities with a total population of 977,279;
- the 30 areas identified in 2014–2020 that have revised boundaries compared to their original configuration due to the inclusion and/or exclusion of municipalities. These now involve 556 municipalities with a population of 1,324,220:
- the "Special Project for Minor Islands," which includes 35 municipalities located on the islands, with a total population of 213,093.

In total, this comprises 124 project areas, involving 1,904 municipalities and a population of 4,570,731.
[Department for Cohesion Policies. (n.d.). The Inner Areas 2021–2027. https://politiche-coesione.governo.it/it/politica-di-coesione/strategie-tematiche-e-territoriali/strategie-territoriali/strategia-nazionale-aree-interne-snai/le-aree-interne-2021-2027/]

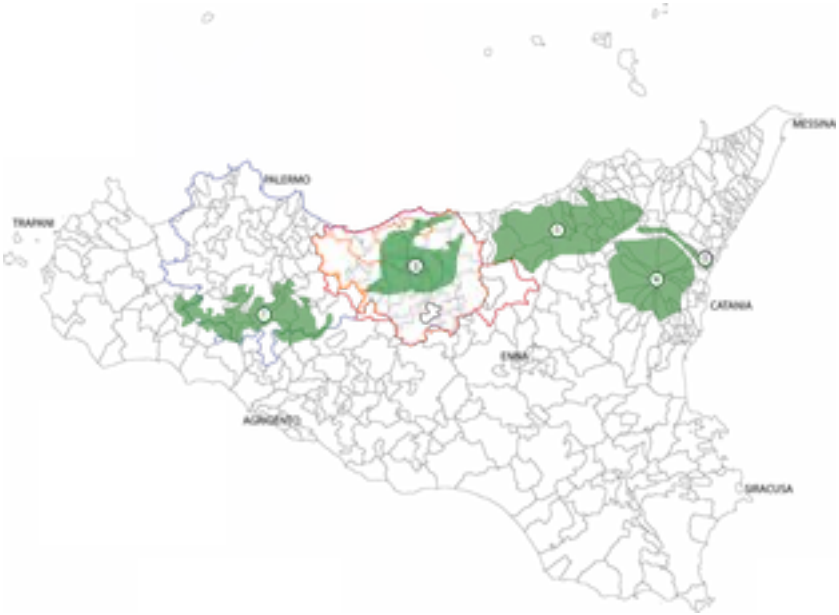


Fig. II.2 | Sicilian Parks ©Luisa Lombardo, 2022.

1. Sicani Mountains Park (40,000 ha);
2. Madonie Park (39,941 ha);
3. Nebrodi Park (86,000 ha);
4. Etna Park (59,000 ha);
5. Alcantara River Park (1,900 ha).

season, and are heavily influenced by adverse weather conditions. The SNAI project aims to promote the sustainable development of these territories by improving infrastructure and services, enhancing natural and cultural resources, and supporting local economic activities.

The selection criteria for these areas were based on:

- their potential for economic and social development;
- population density;
- unemployment levels;
- the percentage of the population of school age;
- the presence of infrastructure and services.

One of the distinctive features of Inner Areas, especially in Sicily, apart from the presence of small settlements and depopulation, is their natural beauty (*Fig. 2*). Most of Sicily's inner areas are characterized by breathtaking landscapes, ranging from hills covered with olive groves and vineyards to majestic mountain peaks[3]. A notable example is the expansive Madonie Park (Antista, 2011), the focus of this study, which encompasses 21 small Sicilian municipalities. These generous lands produce high-quality agricultural products, such as olive oil, cheeses, fine wines, and traditional culinary delicacies, now recognized as part of the Slow Food movement. Moreover, the history and culture of these regions trace back to ancient times.

There are many towns that still preserve traces of the past, with their cobblestone alleys, historic churches, and medieval castles perched on hills,

[3] Pizzo Carbonara is the highest mountain in the Madonie, a mountain massif located in the northern part of Sicily. Standing at 1,979 meters above sea level, it is the second-highest mountain in Sicily after Mount Etna. It is situated within the municipality of Isnello, south of the renowned tourist town of Cefalù. Composed of a limestone massif, it features sheer cliffs and steep slopes. Its summit offers breathtaking panoramic views of the Madonie, the Gulf of Palermo, and the Tyrrhenian Sea. On clear days, it is possible to see Mount Etna and other Sicilian mountains.
Pizzo Carbonara is a very popular destination for hikers. The ascent is challenging but provides great satisfaction for those who reach the summit.
[Wikipedia. (n.d.). Pizzo Carbonara. In Wikipedia. Retrieved August 9, 2024, from https://it.wikipedia.org/wiki/Pizzo_Carbonara]

Fig. II.3 | Madonie Park Area and Madonie Municipalities. ©Luisa Lombardo, 2022.

1. (in dark green) Ultra-peripheral areas;
2. (in green) Peripheral areas;
3. (in light green) Intermediate areas.

recounting stories of various dominations and influences, creating a unique blend of local traditions and customs (Caruso et al., 2001).

However, despite their beauty and authenticity, Sicilian Inner Areas face several challenges, chief among them being depopulation.

In parallel with the geographical analysis, an in-depth socio-economic evaluation was conducted, focusing specifically on the identified case study, namely the Madonie Park (*Fig. 3*) and its 21 associated municipalities. This phase involved the collection and analysis of data related to average income, employment, education, and other socio-economic indicators. The objective is to understand the economic structure of the inner areas, identifying predominant economic activities and highlighting potential development sectors (Cedrini, 2006).

It is essential to update and analyze data to obtain a comprehensive overview of the current situation and to monitor ongoing conditions effectively. The analysis conducted across Sicily, resulting from the collaboration of doctoral candidates from the Department of Architecture at the University of Palermo and tied to the "European Researchers' Night 2023"[4] project, focused on the theme of Sicily's inner areas. This initiative highlighted all the research carried out on the subject across various disciplinary fields, such as urban planning, restoration, design, and architectural engineering.

The graphs illustrate demographic trends, the peripheral nature of these areas, and the percentage decline in population (*Fig. 4, 5, 6*). These areas cover nearly 50% of the island's surface, where the lack of adequate infrastructure, difficulty of access, and youth emigration represent some of the challenges threatening the vitality of these communities[5].

Moreover, tourism promotion tends to concentrate primarily on coastal locations, often overlooking the hidden, more authentic treasures of the inner regions (Barca, 2018).

Another crucial aspect of the methodology was the analysis of environmental considerations. The inner areas often feature a significant natural and architectural heritage (*Fig. 4*), and the assessment of the environmental impact of human activities was integrated into the analysis. Lastly, but no less importantly, an evaluation of the funds allocated through the SNAI strategy for these territories was conducted to understand the pathways undertaken, the projects implemented, those in progress, and those yet to be developed in the area (*Fig. 7*).

This holistic approach, encompassing various parameters and employing both quantitative and qualitative methods, made it possible to identify sustainable development opportunities that reconcile economic needs with environmental preservation.

The in-depth understanding of the vulnerabilities and potential of these areas provided a solid foundation for developing targeted, sustainable, and, above all, compatible strategies. The ultimate goal is to contribute to territorial rebalancing and the enhancement of resources in the inner areas, fostering integrated and harmonious development for both the studied regions and Sicily as a whole.

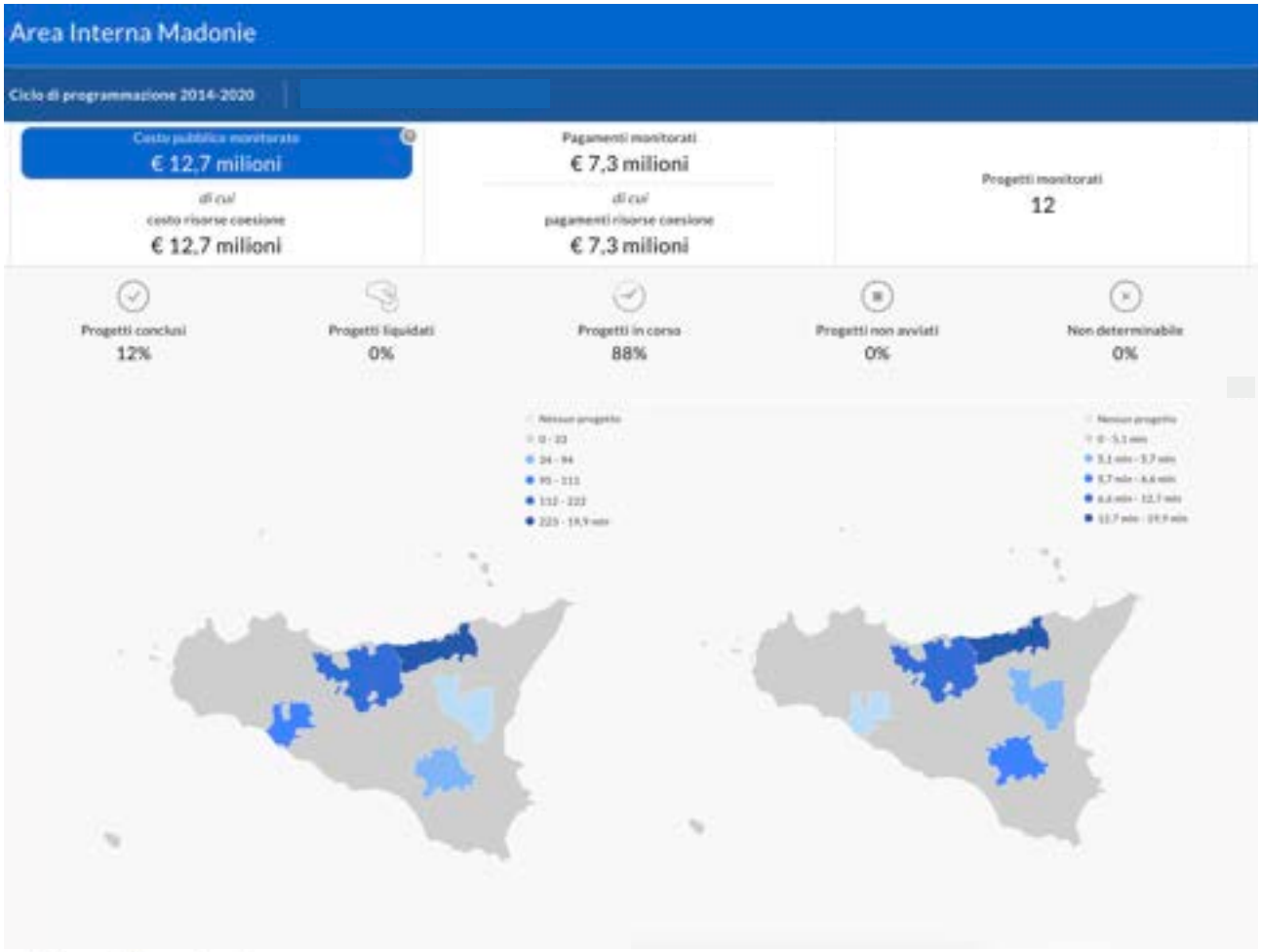
This will enable, starting from what is present or lacking, the establishment and analysis of the foundations to create a network of *Smart Villages* within the study area.

[4] [University of Palermo. (2023). SHARPER 2023. https://www.unipa.it/SHARPER-2023/]

[5] Furthermore, the OpenCoesione website of the Agency for Territorial Cohesion highlights a scenario in which difficulties in spending are present across all public policies, not just those based on "social dialogue." It is also verifiable on the Agency's website that the average programming time for each pilot area followed by the SNAI is two to three years. This may not be such a long time to build responses to problems that, until now, have not been solved. Moreover, a study by the London School of Economics (Crescenzi, Giua, Sonzogno, 2021) recently showed how it is possible to build a modern and effective operational framework for public policies based on the evidence and experience gained from the SNAI. This framework would be capable of simultaneously opening up to civil society and the productive sector, to health and education directors, to advocates in metropolitan areas, and to actors who can make a difference in the ecological and digital transition.

SOCIO-DEMOGRAPHIC ANALYSIS OF SICILY

Fig. II.4, 5, 6 | Demographic trend, Level of peripherality, Percentage decrease in population ©Luisa Lombardo, Alejandro Gana, Derireè Saladino, Fabrizio Giuffrè, and Samuele Morvillo, 2023.



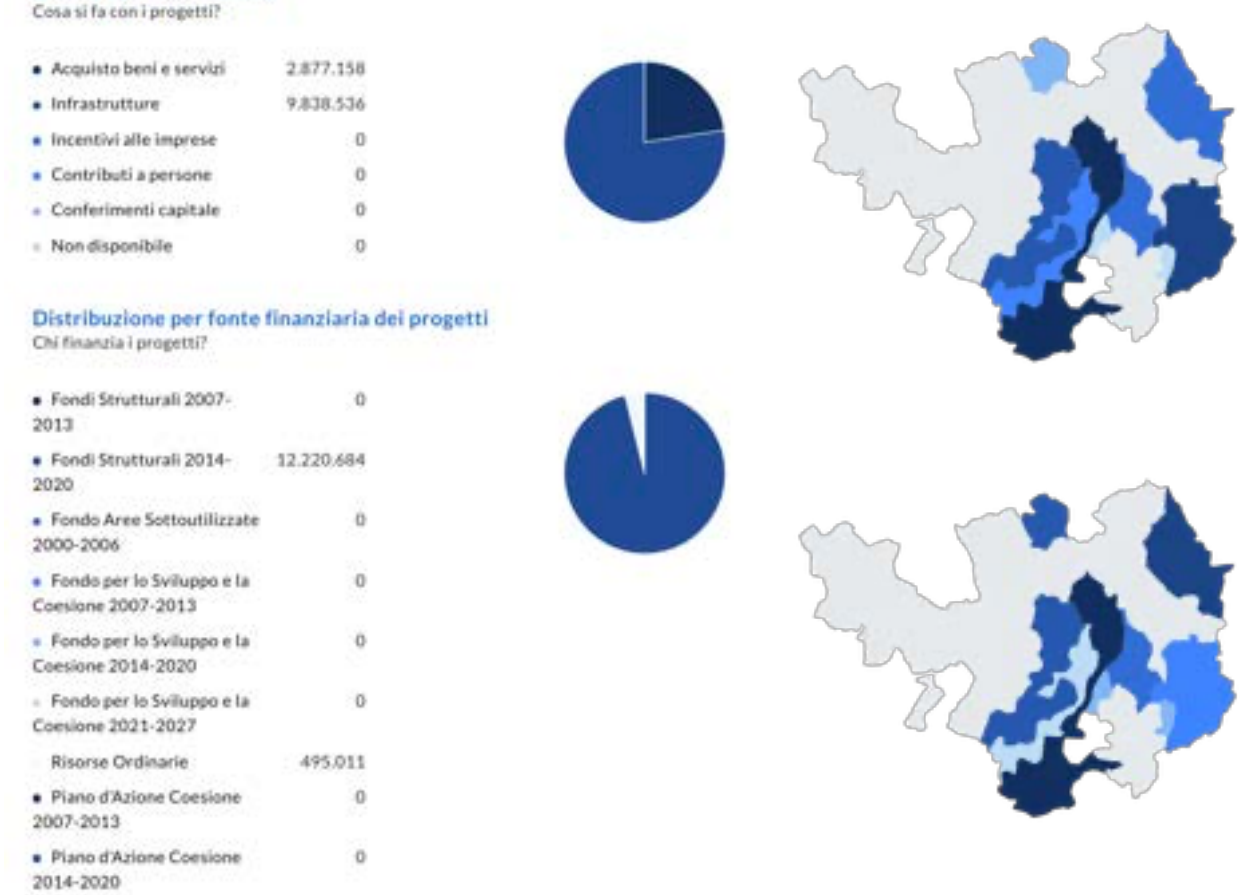


Fig. II.7 | Source: OpenCoesione. (2024). Inner Area Sicily Region. https://opencoesione.gov.it/it/dati/strategie/AI/sicilia-regione/

II.1 Inner areas and the 21 minor centers of the Madonie

The focus of the research specifically concerns the central area of Sicily, and particularly the Madonie region, which, in terms of size, along with its 21 municipalities, is the largest of the Inner Areas in Sicily, followed by the Nebrodi, Calatino, Sicani, and finally the Simeto Valley.

The entire Madonie enclave is located within the Madonie Park, a mountain range situated in the central-northern part of Sicily, within the province of Palermo. Together with the Nebrodi Mountains and the Peloritani Mountains, it forms what is known as the Sicilian Apennines, a green lung of crucial importance for the island's water supply (Farinella, 2010).

In 1981, the Madonie Park became a protected area, followed by the establishment of the Madonie Park Authority in 1989 with Regional Law No. 9 of March 26. The Madonie Park was recognized as a UNESCO[1] Global Geopark in 2015, becoming the first Italian Geopark to join the global network.

This recognition was achieved thanks to the geological, geomorphological, and naturalistic value of the Park's territory. This lays the foundation for a specific approach with particular attention to the natural component, making it one of the richest areas in the Mediterranean.

[1] The Madonie UNESCO Global Geopark is located in Sicily, in the heart of the Mediterranean, among some of the most beautiful landscapes of particular interest both geologically and geomorphologically, as well as from an educational perspective. Over time, no guide to Sicily or Italy has failed to dedicate dozens of pages to the Madonie. It represents almost all aspects of Sicilian geology, with a very complex history that began over 220 million years ago. It is mainly composed of dolomitic limestone, which evokes unknown and vanished worlds. Interesting karst formations, both on the surface and underground, developed more recently, 23.5 million years ago.
Its location in the central part of the Sicilian Apennines, its geological-structural configuration, and the morpho-dynamic processes that act within it make this mountain group a key area for understanding and reconstructing the geological history of the Apennine-Maghrebian chain and, therefore, the central Mediterranean. For these characteristics, the Madonie

Fig. II.1.1 | Sicily and the SNAI area of the Madonie. ©Luisa Lombardo, 2022.

have been and continue to be an exceptional area of study, as well as a "training ground" for generations of university students in geological sciences and natural history. The area contains seven types of formations recognized by the international scientific community and more than forty geosites. Recent tectonics also make the area an excellent training ground for geo-hazards.
The Madonie UNESCO Global Geopark also preserves a very rich and rare natural heritage. In a very small area, about 2% of Sicily's surface, over half of the species of more evolved flora grow: about 2,600 plants, almost the same number of species found in Egypt, Tunisia, and Algeria. The Madonie also host hundreds of endemic plants that are unique in the world, many of which have only a few specimens and are at risk of extinction. The most famous and "courted" is the Nebrodi fir, but there are many others. Equally interesting are the signs left by humans in the landscape: fields, watercourses, villages, and hamlets testify to the many ways communities have lived in the Madonie, leaving indelible marks and expressing the intrinsic reasons of a culture.
[Parco delle Madonie. (2022). Geoparco delle Madonie - Patrimonio UNESCO. https://www.parcodellemadonie.it/geoparco-delle-madonie-patrimonio-unesco/]

Fig. II.1.1.1 | Specimen of Abies Nebrodensis. ©Wikipedia, 2023.

Fig. II.1.1.2 | Ventimiglia Castle in Castelbuono. ©Carmelo Di Salvo, 2021.

II.1.1 Historical and territorial framework

The Madonie represent a territory rich in history, with ancient medieval towns, centuries-old forests, wineries, pastures, valleys, hills, and wheat fields. It is considered one of the most valuable protected areas in Sicily in terms of naturalistic, landscape, and historical-cultural significance, with more than 24 hiking trails suitable for all, from the young to the old, featuring natural, faunal, and floral species of great value.

The trails lead to the second highest peak in Sicily, from where vast panoramic views extend as far as the Aeolian Islands, Mount Etna, and the mountains of Enna and Agrigento, thanks to the central location of the area. The highest peak is Pizzo Carbonara, which rises to 1,979 meters above sea level, making it the highest mountain in Sicily (excluding Mount Etna). From here, a breathtaking panorama of Sicily unfolds: to the north-east, the Nebrodi and Caronie mountains toward Messina and Mount Etna, the Aeolian Islands visible on clear days, and to the south, the peaks of the Sicani mountains and the African sea.

In this area, one can admire the last remaining specimens of Abies Nebrodensis (*Fig. 1*), the famous Christmas tree, listen to the sounds of nature in the shade of the giant holly trees of Piano Pomo, discover some snow, and learn techniques for dairy production in the small hay barns still standing. Furthermore, plants typical of at least three continents coexist in the same environment.
The Madonie Park offers landscapes that are quite diverse: from the northern coastal belt, one passes to the mid-hilly area and then climbs, kilometer after kilometer, to the highest peaks of the inner region facing south. Each altitude offers views to admire, with vegetation that changes through the seasons, representing a Mediterranean habitat in every aspect. From the green and flowering meadows in spring to the autumn foliage, and the white snowy blanket covering every surface during the cold, harsh winters. It is an ideal place for nature lovers and outdoor enthusiasts, with many marked trails, some of which are simple and accessible for those not familiar with such paths, while others are more challenging, suited for a more experienced audience or to be tackled with the expertise of hiking guides (Giacomarra, 2000).

In addition to its natural features, the Madonie area is predominantly made up of medieval towns, characterized by narrow cobbled streets, perched on high ground and panoramic locations, with ancient houses built from thick and solid limestone walls, either exposed or plastered, and adorned with flowered balconies, fountains, churches, squares, and iconic places that harmoniously blend into the landscape (Musso, 2005).

Thanks to their history and the wealth that once characterized these territories, the towns are rich in cultural heritage and works of fine craftsmanship, although they are often little known even to Sicilians themselves. Among the most well-known cultural assets are the castles, once the residences of feudal lords who governed their lands. Some of them have been converted into museums, while others unfortunately remain in ruins. One of the best-preserved and most utilized castles is the Ventimiglia Castle in Castelbuono (*Fig. 2*). Built in 1316 as a watchtower, it became a noble residence in the 1500s. The Ventimiglia family inhabited and governed the district for centuries. The castle also houses the Palatine Chapel, created by the brothers Giuseppe and Giacomo Serpotta, with the inevitable stuccoes of cherubs and various figures that adorn all the walls. Today, the castle is home to the Civic Museum, which houses rich permanent collections in the archaeological, urban planning, sacred art, and modern and contemporary art sections. The castle square is a symbolic and representative location for the entire town of Castelbuono, where major music festivals are held in the summer, such as the Jazz Festival and Ypsigrock. Other castles, such as those in Pollina, Geraci Siculo, Collesano, Isnello, Polizzi Generosa, and Gratteri, unfortunately, are reduced to ruins, but they still hold a certain charm and help us understand the wealth of the territory even in times gone by. Baro-

que churches are also abundant, with marble and stucco covering the walls and floors, painted ceilings, and typical majolica bell towers. Polizzi Generosa, in particular, is the town with the most ecclesiastical heritage in the entire area. Inside the territory (*Fig. 3*), there are works of great prestige by several Sicilian authors (Brucato, 2009), including the Zoppo di Gangi.
There are many routes that can be undertaken throughout the entire territory, a total of 24 (Anselmo V., 2016). In particular, we can identify three routes of great historical, cultural, and religious value:

1. The **Gaginian route or the "Zoppo di Gangi"**[1] route allows visitors to discover and admire the sculptural masterpieces of the Gagini family. It crosses the Madonie municipalities, including Polizzi Generosa, Petralia Sottana, Petralia Soprana, Gangi, Geraci Siculo, and Pollina. The Gagini family, architects and sculptors originally from Bissone on Lake Lugano, were very active in Liguria and Sicily and are considered among the leading figures of the Renaissance on the island. The most important artist of the family was Antonello Gagini, who left some of his most significant masterpieces in Palermo. The pseudonym was also used by two well-known authors of the 16th and 17th centuries: Giuseppe Salerno (Gangi; 1570 - 1633) and Gaspare Vazzano (Gangi; 1562 - 1630). Their works adorn many churches in the municipalities of the Madonie. The most famous work is the "Last Judgment" on canvas, located behind the main altar of the Chiesa Madre in Gangi, and it is considered the largest "Last Judgment" painting in Italy;
2. The **route of Frate Umile**[2] (real name Giovan Francesco Pitorno), an artist born in Petralia Soprana, is famous for his wooden crucifixes, which emphasize the drama of the event and the pain involved. These crucifixes can be found in many churches throughout Sicily. Among the most important works are those housed in the Chiesa Madre of SS Pietro e Paolo in Petralia Soprana and in the Chiesa del SS Salvatore in Gangi;
3. The **"Frati" path** in the Madonie, inaugurated on January 12, 2023, on the first anniversary of the death of Biagio Conte[3] by Don Carmelo Cuttitta, Bishop of Cefalù, is a trail of about 1,800 meters that begins at Portella Colla and ends at Piano Cervi, a place where the lay missionary Biagio Conte, founder of the Missione Speranza e Carità, used to retreat for hermitage. The path is easily accessible and winds through beech forests, oaks, and chestnuts. Along the way, visitors can admire the beauty of the Madonie nature and learn about the history of Biagio Conte. The route serves as a way to remember his work of charity and solidarity, and also offers an opportunity to experience the stunning beauty of the Madonie and appreciate the pristine nature of this place;
4. Additionally, there is the "**Sentiero dei Briganti**" (Path of the Brigands), a historical route of about 100 kilometers, to be completed in five days. It starts in San Mauro Castelverde, within the Madonie Park, and ends

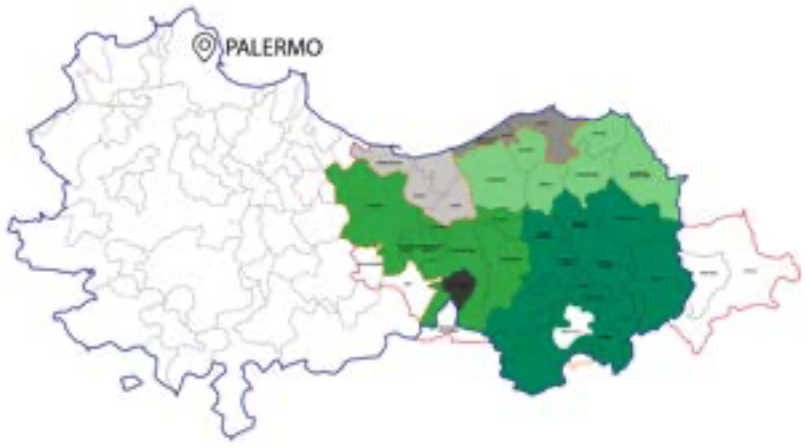


Fig. II.1.1.3 | Madonie Area and Province of Palermo. ©Luisa Lombardo, 2021

[1] The "Itinerario Gaginiano" involves four municipalities of the Madonie – Gangi, Geraci Siculo, Petralia Sottana, and Petralia Soprana – and is the best route to approach the works of the Gagini dynasty, as well as the natural and cultural resources found across these four towns. The route combines artworks by the Gagini family, considered among the most representative, in four municipalities: the Madonna della Catena (16th century, Gagini school) in the Church of the Catena in Gangi, the marble altarpiece (15th century, Antonello Gagini) in the Church of St. Bartholomew in Geraci Siculo, the marble altarpiece (16th century, Gian Domenico Gagini) in the Church of St. Mary of Loreto in Petralia Soprana, and the marble retable (16th century, Gian Domenico Gagini) in the Church of the Holy Trinity at the Abbey in Petralia Sottana.

[2] Fra Umile from Petralia and his 33 crucifixes define his artistic and religious experience as a friar through the depiction of the Crucifix, polychrome and wooden. His production spans from the early 1500s to the early 1600s. The characteristics of the crucifixes include the twisted thorns, the blood from the side, and the blows, all of which highlight the narration of the Passion. Through his connection with the reformed Franciscans, he joined the order in November 1623. After a year of novitiate at the convent in Mistretta (in the Nebrodi mountains), he was ordained a friar, taking the name Umile da Petralia. The number of crucifixes is 33, representing the years of Jesus' life, and throughout history, many have sought to portray his work as the result of a divine gift or a supposed vow made by the itinerant friar sculptor. By the early 1600s, the first wooden crucifixes appeared, drawing heavily from the Franciscans, by order of Pope Leo X in 1513, and the first carving schools were established in Sicily.

[3] Biagio Conte was an Italian lay missionary and philanthropist, known for his extraordinary dedication to charity and solidarity work. Born in Palermo on September 16, 1963, he devoted much of his life to serving others, especially the less fortunate and disadvantaged. His most recognized achievement was the founding of the "Missione Speranza e Carità," an organization dedicated to helping the needy, the homeless, and the marginalized. He worked tirelessly to provide food, shelter, and support to society's most vulnerable, demonstrating extraordinary generosity and compassion. His life was marked by simplicity and a commitment to the cause of charity. Biagio Conte's work had a significant impact on the lives of many people and inspired others to follow his example of altruism. He passed away in Palermo on January 12, 2023, at the age of 59, after a long illness. His legacy remains a beacon of hope and compassion in contemporary society.

in Cesarò in the Nebrodi Park. Created from a historical research by Giovanni Nicolosi, a highly active figure in the area, the trail passes through ancient trazzere (paths) and routes used by brigands between the unification of Italy and the siege of Gangi in 1926. The route aims to rediscover the events related to brigandage, particularly the story of the Maurina band led by Melchiorre Candino and the subsequent groups, culminating in the intervention of Prefect Cesare Mori, who in 1926 brought an end to brigand activity with the siege of Gangi.

The territory also hosts some interesting and unique museums, such as the underground contemporary art museum in Petralia Soprana; a world-first case of a museum inside an active salt mine with sculptures made from rock salt. The Madonie area, divided by altitude (*Fig. 4*) and territorial features into High, Low, and Imerese Madonie, offers a treasure trove of stories to uncover among ancient medieval towns, century-old forests, pastures, valleys, hills, and wheat fields. Inhabited since ancient times, its cities were built in harmony with the natural environment, far from cities and industrial agglomerations, to the point of being considered vernacular architecture today due to the use of local materials and the settlements that, together with isolated buildings, enrich the vast and diverse territory.

This has contributed to the preservation of the material, technological, and aesthetic values of the region. The landscape, environmental, and architectural significance of the area touches around twenty-one urban centers rich in history and culture, sufficiently uniform in the characteristics of aggregation, architecture, and construction. The homogeneity of the urban centers is the result of a rooted local tradition, a cultural unity, and a historical background that has connected the area for over three centuries (Regione Siciliana, 2005).

In recent decades, the Madonie area has continued to develop projects and programs to improve accessibility and production, recording an increase in craft and industrial activities. This has led to a partial growth of the sector at the expense of construction, which has not always been of high quality but instead has remained rooted in the past and within the historic centers.

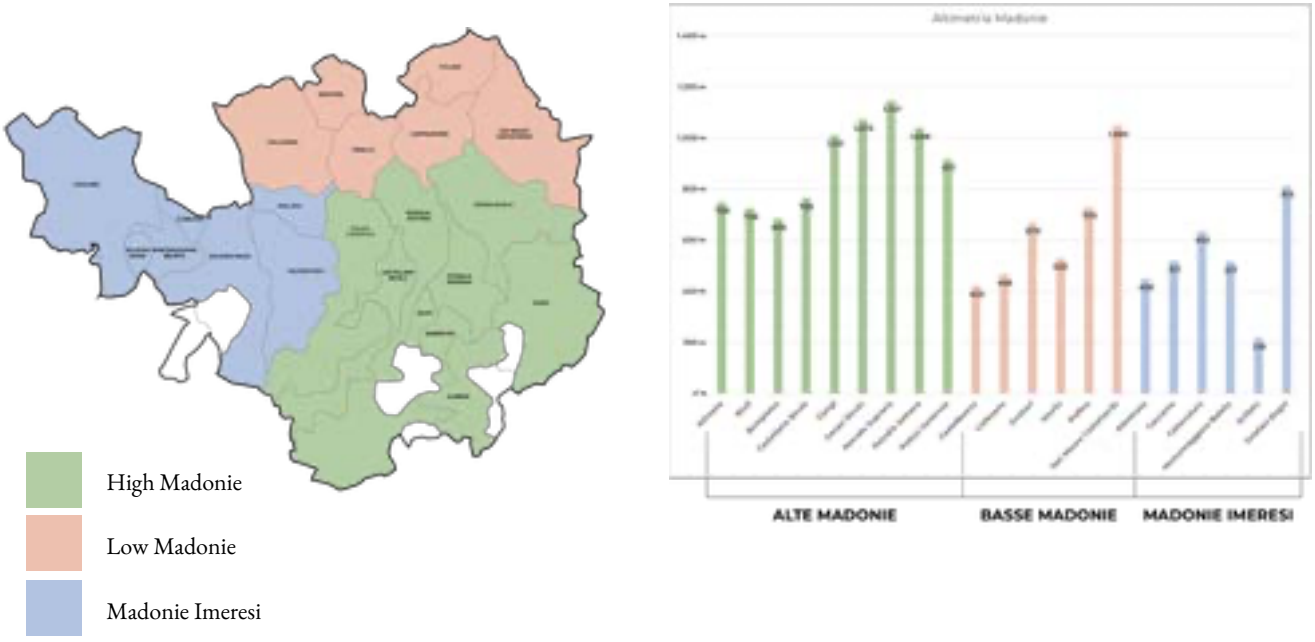


Fig. II.1.1.4 | Division of the Municipalities of the Madonie and Altimetry of the Madonie. ©Luisa Lombardo, 2021

II.1.2 Evolution before and after the SNAI

The twenty-one municipalities of the Madonie Park, located in the province of Palermo, in recent years, with the hope of providing a future for the upcoming generations, have faced various challenges in searching for more suitable forms of collaboration to promote local renewal. Initially, the smaller number of municipalities gradually expanded collaborations and united to favor the overall development of the area.
Local Action Groups (G.A.L.), for example, are local association initiatives whose main goal is to structure and implement a participatory development strategy for a rural area through a bottom-up approach, starting from the specific needs of the territory. Legally, they are often private law entities, such as consortia, that include both private and public *stakeholders*, with the public *stakeholders* holding no more than 49%. Although they are not necessarily defined with predefined structures, they may, for example, be established as a partnership with a lead organization. They are co-financed with the support of European, national, and regional funds. Through these funds, the G.A.L.s plan and promote rural development by drafting a local action plan (Cicero Bellizza, 2017).
The Madonie G.A.L., established in 2007 and based in Castelbuono, aims to promote the rural development of the area through the implementation of projects related to agriculture, agri-food, tourism, craftsmanship, and the environment. Initially, the area included 12 municipalities, but over the years it has expanded to 34 units.
Over the years, it has carried out numerous rural development projects that have contributed to improving the quality of life of the residents and promoting the tourist appeal of the Madonie.
• **Project "Madonie in Tasca":** project for the promotion of agri-food tourism in the Madonie area;
• **Project "Madonie a Pedali":** project for the promotion of sustainable tourism in the Madonie area;
• **Project "Madonie in Fiore":** project for the promotion of nature tourism in the Madonie area;
• **Project "Madonie Smart":** project for the promotion of technological innovation in the Madonie area;
• **Project "Madonie Cultura Accessibile":** project for the promotion of accessibility in the municipalities.

Projects initiated in concert, but which never gained appeal and lacked follow-through.

To create a new *governance* capable of recovering the decision-making levels undertaken in the area, the municipalities decided to establish the Union of the Petralie (*Fig. 1*), with the goal of creating shared projects and promoting the systematization of resources, as well as bringing together the remaining municipalities in the district.

Some regulatory obstacles, over time, prevented the establishment of new Unions of Municipalities, keeping the territory divided for years. Later, with the advent of the National Strategy for Inner Areas (SNAI), two more Unions were formed, encompassing nineteen of the twenty-one municipalities in the area: the Union of the Municipalities of Madonie and the Union of the Municipalities of Northern Val D'Himera (*Fig. 2*). Finally, the Union of Municipalities "Madonie" was established in 2009, with the aim of reuniting the local territory under frameworks that allowed for economies of scale in the provision of services to citizens and ensuring equal representation of all municipalities in the Union, which consists of 12 municipalities in the province of Palermo, including: Alimena, Aliminusa, Bompietro, Caccamo, Castelbuono, Castellana Sicula, Collesano, Geraci Siculo, Isnello, Polizzi Generosa, Scillato, and Sclafani Bagni.

The Union, with a defined organizational structure, still based in Castelbuono, aims to promote the economic, social, and cultural development

[1] They were initially defined during the 1990s within the Leader strategy (Liaison entre Actions de Développement de l'Économique Rurale, which translates to "linking actions for rural economic development"), which aimed to connect and actively involve the local population in a rural area. During the 2014-2020 funding cycle, the scope of this approach was further extended to participatory local development (Community-Led Local Development, CLLD) in rural, urban, and fisheries areas. This expansion made it possible for Local Action Groups (LAGs) to access not only the European Agricultural Fund for Rural Development (EAFRD), but also the European Maritime and Fisheries Fund (EMFF), the European Social Fund (ESF), and the European Regional Development Fund (ERDF). [*Openpolis. (n.d.). What are GALs (Local Action Groups)? https://www.openpolis.it/parole/che-cosa-sono-i-gal-gruppi-di-azione-locale/*]

[2] A Local Action Group (LAG) is a tool promoted by the European Union to develop plans and programs dedicated to the socio-economic improvement of rural communities. LAGs are groupings of public and private partners that represent both rural populations, through the presence of local public entities (municipalities, provinces, and mountain communities), and the organizations of economic operators present in the territory. LAGs participate in the implementation of the Rural Development Program (RDP) 2014-2020, the main tool used by the Autonomous Region of Sicily to promote the development of agriculture and rural areas, by preparing and implementing Action Plans (APs), which are the programming tool for defining and activating the local development strategy of each LAG. The RDP is also the programming tool for rural development policy funded by the EAFRD (European Agricultural Fund for Rural Development), which defines, in line with the objectives of the Europe 2020 strategy, the National Partnership Agreement and the National Programs, the regional interventions for the 2014-2020 programming period.

[3] A territorial coalition that gave rise to the strategic program "Madonie Resilienti: Laboratorio di futuro," establishing itself as the Union of Madonie Municipalities and as the Unified Procurement Center. The area strategy consists of more than 20 project interventions distributed across different thematic areas of local development. For the experimentation of the integrity pact, two were selected, considered crucial for territorial development and their impact on citizens: energy (energy efficiency and renewables) and education, with the procurement center represented by ReSMa (Madonie School Network).

Fig. II.2.1.1 | Territorial arrangement of the Madonie before the SNAI. ©SNAI, 2021.

1. (in red) Union of the Ventimiglia Municipalities;
2. (in orange) Union of the Petralie and Imerese Municipalities;
3. (in green) Union of the Municipalities of the Madonie Park Gates;
4. (in blue) Union of the Re.Al. Imera Municipalities;
5. (in yellow) Union of the Val D'Himera Municipalities;
6. (in purple) Union of the Valdemone Municipalities.

Fig. II.2.1.2 | Territorial arrangement of the Madonie after the SNAI. ©SNAI, 2021.

1. (in light blue) Union of the Madonie Municipalities;
2. (in green) Union of the Northern Val D'Himera Municipalities.

of the member municipalities through the joint management of functions and services. The guidelines for this *governance* were further developed by the "Madonie Resilienti" strategy, which covers various topics, including healthcare, education, local public transport, digital networks, and the union and collaborative network of municipalities. Among the proposed initiatives are the maintenance of the Hospital Center in Petralia Sottana, the strengthening of emergency services, the establishment of new functions such as motor and respiratory rehabilitation, and the promotion of telemedicine. On the education front, the goal is to develop the Madonie School Network and recognize the Optimal Educational Area.

For local public transport, the introduction of new circular routes between the municipalities and between the territory and the airports of Catania and Palermo is planned, keeping costs unchanged. To ensure adequate connectivity, the installation of broadband and ultrabroadband networks in the municipalities of the Inner Area was planned, with the goal of completing it by March 2018, but work is still ongoing. Finally, regarding the Union of Municipalities, it is expected that the operating costs for individual municipalities will be eliminated, thanks to the economies of scale achieved in connectivity, software, and telephone utilities.

Both the GAL Madonie and the Union of Municipalities (*Fig. 6*) are important points of reference for the rural development of the Madonie area (Trapani et al., 2013), promoting the region's tourist appeal and environmental sustainability through the implementation of new rural development projects; the foundation lies in the desire to collaborate and work as a team.

Currently, the administrative management system of the Madonie sector (*Fig. 3*) operates in a pyramidal structure, with the President of the Madonie Park at the top, along with the Council and the Executive, followed by the Mayors and the City Councils of the various municipalities in the area, the Young Mayors, who provide a future perspective for the territory, followed by the Youth Councils, and finally, the practice of Civil Service, which integrates youth and strategies, as well as innovative pathways to promote activities in the area. Today, this territorial structure also includes other interior municipalities and a public/private partnership for managing community projects and initiatives (*Fig. 4*).

Fig. II.2.1.3 | Madonie Park ©Carmelo Di Salvo, 2022.

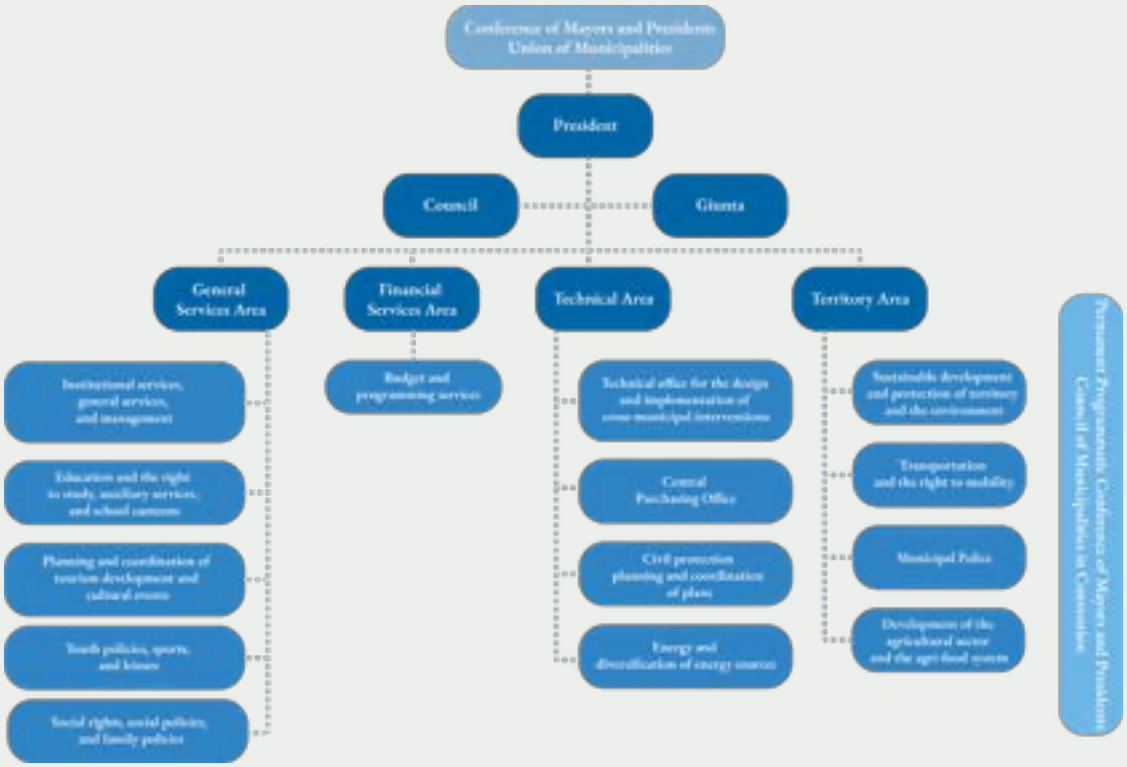


Fig. 3 | Union of Municipalities "Madonie": Organizational Structures. ©Luisa Lombardo, 2022

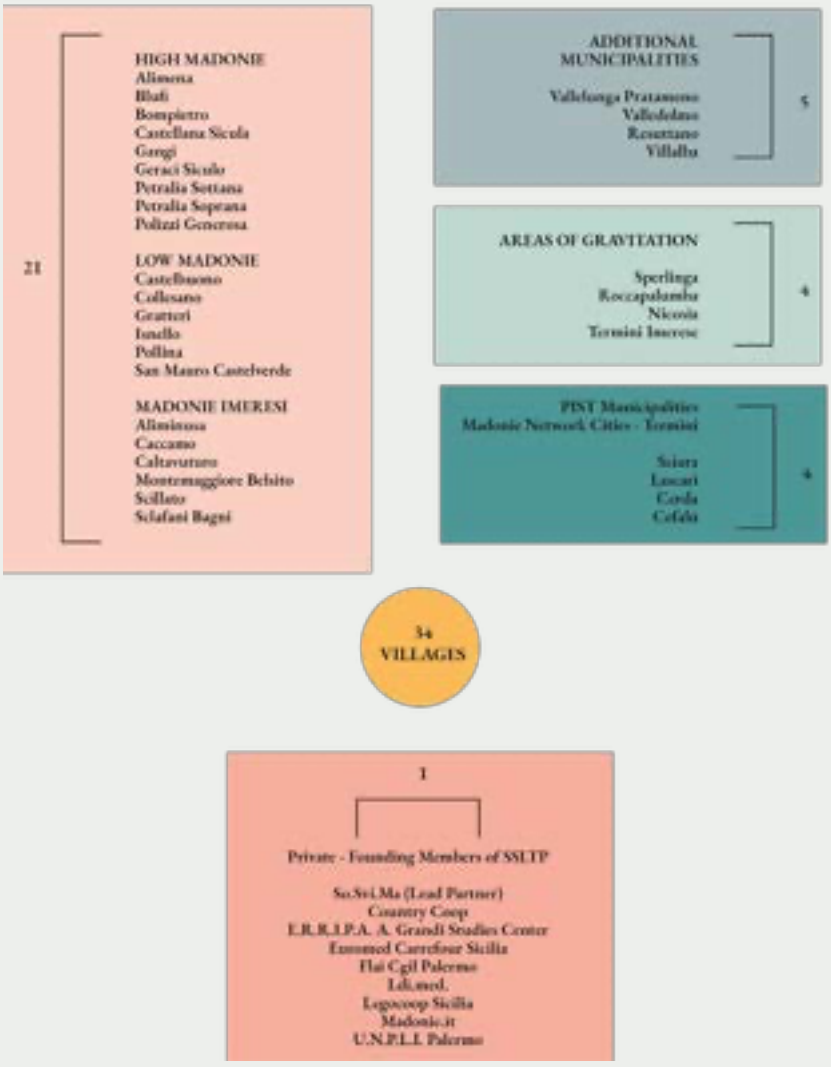


Fig. II.2.1.4 | Subscribing members of the GAL Madonie. ©Luisa Lombardo, 2023

Fig. II.1.3.1 | Alimena, Madonie Park. ©Luisa Lombardo, 2022

Fig. II.1.3.2 | Blufi, Municipality of the Madonie Park. ©Luisa Lombardo, 2022

Fig. II.1.3.3 | Bompietro, Madonie Park. ©Luisa Lombardo, 2022

II.1.3 Local identity traits and material-construction peculiarities

The building rules in the Madonie context have been passed down from generation to generation, as in the rest of the Mediterranean Basin (Bresh, 1986), and are the result of a balanced relationship between humans and the environment. This is extensively discussed in the research conducted by Fatta, Campisi, Li Castri, Lo Piccolo, and Vinci on the presence of vernacular architecture in the area under study. The abandonment of these rules and the adoption of suburban models introduced elements that contrast with the local technical culture, architectural language, and the environmental and settlement conditions. Imported architectures and mass housing have disrupted delicate historical fabrics in recent years. While maintaining their identity, sometimes it is possible to identify inconsistencies in the construction evolution (Scinà, 1988). This is due to two opposing impulses: the need to renew the building stock and adapt it to contemporary life needs, while on the other hand, the desire to preserve the environmental quality of a tradition not to be renounced.

Although some interventions are objectively foreign to the history and language of local architecture, a careful reading recognizes in the simplicity and approximation of the solutions a will of the inhabitants to reconnect with the place's architectural code. This is evident in the choice of stone (*Fig. 1*), the exposed masonry, the frames around exterior openings, and the ironwork of balconies, which can be found walking through the streets of the towns (Fatta et al., 2010).

The particular terrain and climate have influenced how houses have been built over the centuries (*Fig. 2*). They are often grouped in a single complex, both in areas with medium and high population density. The housing complexes are separated by winding alleys, stairs, arches, squares, and courtyards, which are some of the identifiable characteristics found in each of the twenty-one towns in the region. There are different types of complexes depending on the characteristics of the natural environment and historical development. However, there are many common elements, such as the compactness of volumes and architecture, and the typological and constructional seriality of the residential units.

Through the analysis of the recognizable parts of the original architecture, it is possible to identify the construction lexicon and the primary typological-functional matrix of the so-called "minor" building heritage. This heritage is even more representative, compared to monumental buildings, of the architecture of small mountain towns.

Vernacular architecture in the Madonie area is conditioned by the building materials available locally, from nearby quarries, and by the construction techniques used, which depend on immediately available local resources, limited technical and economic means, and difficult transport and connection conditions. It can be defined as architecture without architects, the result of widespread construction knowledge, especially linked to the farming world (Castagno, 1982). Over the centuries, these factors have contributed to defining the typicality of the area, leading to technical and formal results often original and unique to this region, not found in other Sicilian or non-Sicilian areas.

Except in rare cases, load-bearing walls are made of compact limestone or quartzarenite extracted from the numerous local quarries. The more resistant and finer-grained varieties are preferred for finishing elements such as portals, lintels, doorposts, frames, cornices, brackets, and balcony floors. The statically excessive dimensions of these elements seem justified to resist frequent earthquakes, but even more to improve indoor comfort.

The walls are built with natural unworked stones (*Fig. 3*), which makes the structure less efficient and requires more labor to construct. Bricks are used only in certain areas where kilns are still present and built according to standard construction rules, while elsewhere, bricks are used only for light superstructures, load-bearing arches, thin vaults, and finishing and installation elements such as cornices, floors, roofs, and drain pipes.

Fig. II.1.3.4 | Caccamo, Madonie Park. ©Luisa Lombardo, 2022.

Wood is the primary material for floors (Tampone et al., 2002), which may be flat or inclined in the case of roof floors. The floors are often made from hardwood, while the infill is typically made of reeds, plaster, or cork. Cork is easily available in forested areas and is used to lighten floors, improving thermal and acoustic insulation (Campisi, 2001).

Rainwater is rarely collected but is often directly diverted. Therefore, cornices are particularly important both technically and aesthetically; they are often made of several layers of overhanging tiles, staggered and overlapping in one or more "hooded" rows. Sometimes, access openings were protected from rainwater by a brick eaves connected to a "butterfly" or a conical-section glazed drainpipe, known as "catusati."

Portals and balconies are the most effective and widely used elements for completing and beautifying a façade. They are made of square stone blocks connected by lintels or arches. The jambs often include a stone that functions as a notch for the adjacent masonry. The arches vary from the most common stone solutions, with a prominent and carved keystone, to those made of rubble and bricks arranged in a "knife" pattern.

Balconies are made of local compact stone and have protruding designs following intricate and attractive patterns. The brackets, railings, and grilles made of iron and cast iron alternate typical designs derived from the tradition of Western Sicily (*Fig. 4*).

The aggregate forms of vernacular architecture in the Madonie are strongly influenced by the topography and adjacent streets. External stairs, attached to the main body of the house, whether lateral or frontal with a floor landing, have gradually been replaced by inner stairs due to the widening of roadways for the passage of cars, no longer just horses and carts. When the block develops linearly according to the maximum slope, the double building body is divided into apartments with a single street-facing elevation, with a maximum of two stories.

On flat roads in steep areas, the blocks generally consist of a single building body, with a double-facing elevation only on upper floors, entrances on roads at different levels, and a strong vertical development of the fronts facing downhill. Another common form of aggregation is the "double-row" or "spine" configuration, where each unit has one free side and is in contact with the two lateral units and the one behind it (*Fig. 5*). This configuration is preferred when the layout is close to the north-south axis, as it allows the eastern front to be lit in the early morning and the western front in the afternoon. In areas where the terrain forces an east-west orientation, the single row configuration is more common, as it ensures sunlight exposure on the southern fronts of all units.

Random-type aggregations are widespread, creating a complex plano-altimetric configuration with variable depths and heights of building bodies, different plant distribution geometries, and alternating volumes, often interrupted by "voids" that lighten the dense urban fabric, such as covered passages, courtyards, alleys, and squares. The narrow and winding outdoor spaces have the advantage of dampening cold winds, while in summer, they alternate between shaded and sunlit zones.

Fig. II.1.3.5 | Caltavuturo, Madonie Park. ©Luisa Lombardo, 2022.

Throughout the Madonie mountainous region, there are both single-story houses (terrana) and two-story houses (casa solerata). These basic residential units, through their spatial evolution (volume growth, merging, facade or depth doubling...), have led to a wide variety of configurations that have adapted to new housing needs and models.

The most common residential unit on the ground floor is typically 5 meters wide and 6-7 meters deep, with a single street-facing opening for access, lighting, and ventilation. For a long time, it served as both a dwelling and a storage space for animals. The terrana house naturally evolves into the solerata house, obtained by adding a wooden loft against the rear wall, accessed via a ladder.

The raising of single-story houses required the construction of an external staircase parallel to the facade, called "annìto." The annìto was built

on a masonry core, and the landing was set on a coarse barrel vault that framed and protected the access to the ground-floor space. The landing of the annìto was used as a small outdoor private space, a substitute for a larger balcony.

Aggregated "row" units, aligned along the street, established a direct relationship between the private space of the residence and the public space of the street. Squares and dead-end alleys became common open spaces for a small community, where many daytime activities were carried out during the warmer periods.

In more complex aggregations, two or more basic units were merged by superimposing or juxtaposing adjacent building bodies. In houses formed by merging two neighboring units, one body was used as a warehouse, and the other as a residence with a kitchen on the ground floor, possibly with an expansion for the alcove on the upper floor. The vertical aggregation of three levels typically had the non-residential area (storage, cellar, ...) on the ground floor, the kitchen and living area on the upper level, and the bedroom in the middle.

Aggregations of adjacent units with added upper floors, associated with the emerging bourgeoisie, led to the creation of "small palaces" in family condominiums. These cases typically enriched the facade with elements such as balconies, cornices, and portals. Further variations were represented by typological and formal differences between corner houses, end units, and those within the building block (*Fig. 6*). While the floor plans of the rooms remained similar, the arrangement of the architectural fronts differed, reflecting variations in the location of entrances, the positioning of external stairs, and the presence of blind or perforated walls (Fatta et al., 2007).

Fig. II.1.3.6 | The municipality of San Mauro Castelverde ©Tania Meli, 2022.

II.1.4 Territorial division

The territory is then divided, according to the latest SNAI strategy, into High and Low Madonie and Imerese Madonie; each area includes different municipalities..

In particular, the High Madonie (*Fig. 12*) includes

- Alimena;
- Blufi;
- Bompietro;
- Castellana Sicula;
- Gangi;
- Geraci Siculo;
- Petralia Sottana;
- Petralia Soprana;
- Polizzi Generosa.

Low Madonie:

- Castelbuono;
- Collesano;
- Gratteri;
- Isnello;
- Pollina;
- San Mauro Castelverde.

The last group, that of the Madonie Imeresi:

- Aliminusa;
- Caccamo;
- Caltavuturo;
- Montemaggiore Belsito;
- Scillato;
- Sclafani Bagni.

In the following chart, the territorial division just analyzed. (*Fig. 12*) The absolute guardians of the beauty of the Madonie Park are its 21 municipalities, also defined as *'diamonds set in rock.'* The towns located in the Madonie, in addition to reflecting the typical Sicilian atmosphere, share further common elements (Trapani et al., 2013). These elements manifest themselves in architecture, art, and deeply rooted local traditions. Geography and, above all, history underpin the distinctive identity of this region, known as "Madonite." For centuries, the area was ruled by a powerful noble family, the Ventimiglia, whose influence has visibly endured over time.
Below is the cataloging of the twenty-one municipalities, divided by area of the district, and the description of their morphological, architectural, and historical peculiarities.

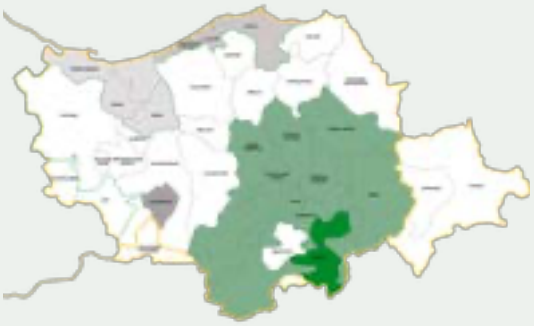
Fig. II.1.4.1 | Territorial layout of the Madonie in Alte and Basse Madonie and Madonie Imeresi. ©Luisa Lombardo, 2022.

- (in dark green) SNAI territorial area Alte Madonie;
- (in green) SNAI territorial area Basse Madonie;
- (in light green) SNAI territorial area Madonie Imeresi.
- (in light gray) Strategic gravitational area for the SNAI Madonie Imeresi area;
- (in gray) Strategic gravitational area for the SNAI Basse Madonie area;
- (in dark gray) Strategic gravitational area for the SNAI Alte Madonie area.

Alimena

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	1.766 inh. (01/01/2023 - Istat) 59,70
Area	km²
Density	29,58 ab./km²



Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.1816

Geographic data

Altitude	740 m a.s.l. - minimum: 342 - maximum: 1.003
Geographical Coordinates	*sexagesimal system* 37° 41' 40,92" N - 14° 6' 52,20" E *decimal system* 37,6947° N - 14,1145° E

History

Located at an altitude of 750 meters, Alimena is situated on the slopes of the Madonie, surrounded by vast stretches of land cultivated with wheat, between the Northern Salso and the Southern Imera rivers. The town of Alimena occupies the southeastern region of the Madonie, near the Balza di Areddula, on the watershed between the aforementioned rivers. Its origins date back to the 17th century, a period when intensive agricultural activity characterized the area. The first buildings were erected at the request of Pietro Alimena, but the town further developed only in 1628, when his successor Antonio Alimena (titled Marquis) obtained from the Spanish crown (Philip IV) the "licence to populate" with all the "jurisdictions and other things granted in the privilege and deeds." This grant included the areas of Portella Nuciforo, San Filippo, the Mazza estate, and the ancient Imaccara (Garrosia and Bulfara). The urban layout of Alimena follows a nearly regular plan, with an orthogonal road network and alignments along a main axis culminating in the central focal point adjacent to the east side of the Mother Church. Although there are irregular road cuts in the peripheral areas, the building fabric adapts to the slopes of the site. The town still retains its residential and commercial functions, showing signs of building reuse with limited replacements; its state of preservation is considered fair. Among the most significant monuments are the Mother Church, which houses a statue of the Immaculate Conception by Francesco Sorgi; the Church of the former Convent of the Reformed Friars, which holds an unknown artist's 17th-18th century depiction of the Crucified Christ; and the Church of the Holy Souls. Economically, the municipality has a modest agricultural and livestock sector, characterized by small local businesses and a marked phenomenon of emigration. In the countryside of Alimena, grains, almonds, fava beans, olives, and wine are mainly produced. In the past, the area was highly fertile due to the favorable climate and its position between four rivers: Pellizzara, Salso di Gangi, Segnaferi, and Imera Meridionale, as well as the presence of salt and sulfur mines. Among Alimena's districts, "Bolfara" stands out with particularly ancient origins. In the "Burgarito" district, located in open countryside, there is a small apse built on a rock overhanging a stream. Near the sanctuary, there are several noteworthy cave dwellings and a hexagonal church dedicated to St. Alfonso De' Liguori, which originally served as a watchtower over a vast area, including the southern slopes of the Madonie as well as the Erei Mountains. Other notable districts include Destri, Chiappara, Garrasia, Vaccarizzo, and Celsi.
from Comune di Alimena. (2024). Comune di Alimena. https://www.comune.alimena.pa.it/sito/

Blufi

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	875 abitanti (01/01/2023 - Istat)
Area	21,98 km²
Density	39,81 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.734

Geographic data

Altitude	725 m a.s.l. - minimum: 430 - maximum: 871
Geographical Coordinates	*sexagesimal system* 37° 45’ 11,16” N - 14° 4’ 25,68” E *decimal system* 37,7531° N - 14,0738° E

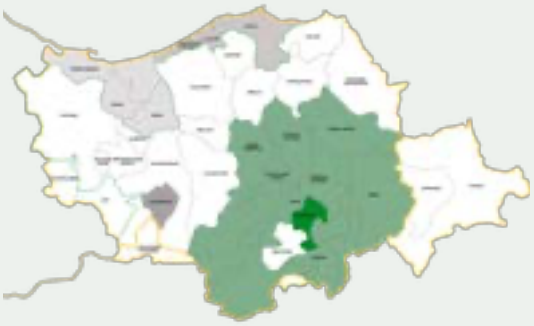
History

The inhabited center extends over a ridge on the southern slope of the Madonie mountains, at an altitude of 720 meters above sea level. The municipal area, covering 2,056 hectares around the main center, includes the administrative district of Casalgiordano, located between the municipalities of Gangi and Alimena. The other districts, such as Alleri, Lupi, and Ferrarello, are separated by the Nocilla stream, while Calabrò, Nero, and Giaia Inferiore form a sort of continuation along the road leading to the Petralie. The territory is crossed by the waterways of the Imera Meridionale River and the Nocilla and Oliva streams, predominantly used for agricultural and artisanal activities. Information about the history of Blufi and its toponym is scarce and unclear. The term "Blufi" first appears in 1211 in a document where the Palermitan church grants to Frederick II, among other concessions, the properties called “Buluf” near Petralia. Over time, variations such as Belufi, Balufi, and Bolufi appear, eventually leading to the current name Blufi in a document related to the Santuario della Madonna dell’Olio. There is a hypothesis suggesting that the name could derive from the Greek words "boos" (ox) and "lofos" (hill), referring to a legendary hill of oxen. However, the most accepted theory is that the name Blufi comes from a gourd-like plant, a herb used medicinally by local inhabitants, found in the area that in Arabic was called Buluf. What is certain is that the historical events of Blufi are closely tied to those of Petralia Soprana, of which Blufi was a district until 1972. Ferrarello represents the largest village in the municipality. It is believed that the toponym derives from the surname of one of its first inhabitants, as the surname Ferrarello is common in the area. The village is divided into the quarters of "Cuozzu," "Signuruzzu," "Collesano," and "Gatto," the latter belonging to the municipality of Bompietro. During the summer, particularly every last Sunday of July, the small village is populated by emigrants returning to their birthplace. In Ferrarello, the Feast of San Giuseppe and the Sacred Heart of Jesus is celebrated on the last Sunday of July, lasting two days with tastings of local products and religious celebrations, followed by a procession with the religious statues carried through the streets of the town by the venerable Confraternity of San Giuseppe of Ferrarello. For the past two years, the village of Ferrarello has once again had its parish church, a modern building that brings new life to the village. The village of Nero, located less than a kilometer from Blufi and dating back to the late 19th century, may have derived its name from the epithet "Niguru" given to one of its first inhabitants, presumably due to the color of their complexion.
from Comune di Blufi. (2024). Comune di Blufi. https://www.comune.blufi.pa.it/it

Bompietro

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	1.201 abitanti (01/01/2023 - Istat)
Area	42,41 km²
Density	28,32 ab./km²



Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.715

Geographic data

Altitude	685 m a.s.l. - minimum: 368 - maximum: 1.007
Geographical Coordinates	*sexagesimal system* 37° 44' 45,60" N - 14° 5' 37,68" E *decimal system* 37,7460° N - 14,0938° E

History

The urban core of Bompietro, located in the southeastern Madonie mountains, lies at an altitude of 685 meters above sea level. This location stands out for its unique charm, which derives not only from its geographical position but also from the strong agritourism vocation that characterizes the area. Bompietro offers visitors an authentic experience, allowing them to immerse themselves in traditional rural life. Walking through the streets of the town, one has the opportunity to closely observe the ancient houses, whose walls darkened by smoke bear witness to the still-living practice of heating milk for the artisanal production of cheese. The ritual of evening milking, combined with the intoxicating scent of wicker baskets overflowing with warm, steaming ricotta, creates an evocative atmosphere that envelops anyone visiting this place. The climate in Bompietro is mild even during the winter months, making the town a pleasant destination year-round. However, summer brings the necessity for shepherds to travel long distances in search of suitable pastures to feed their livestock, adding an additional layer of authenticity to the rural life of the area. It is precisely this combination of ancient traditions and natural beauty that gives Bompietro its magical aura, capable of captivating visitors from every era. The historical origins of Bompietro date back to the 17th century, when some local lords from nearby Petralie discovered this unspoiled corner and decided to establish their residences there. Since then, the town has begun to develop with the construction of the first villas and farmhouses, giving rise to the village we know today. The name Bompietro is inspired by the legendary figure of a "good Pietro," known for his generosity and his ability to heal people using the medicinal herbs found in the area, thereby contributing to the well-being of the community. A visit to Bompietro can start from its charming historic center, with mandatory stops at Palazzo Ganci, the Chiesa Madre, and the churches of Santi Pietro e Paolo, Calvario, and Sacra Famiglia. The town also offers municipal sports facilities, where during weekends, activities like tennis, five-a-side football, or bocce can be enjoyed, adding a touch of dynamism to the rural tranquility.

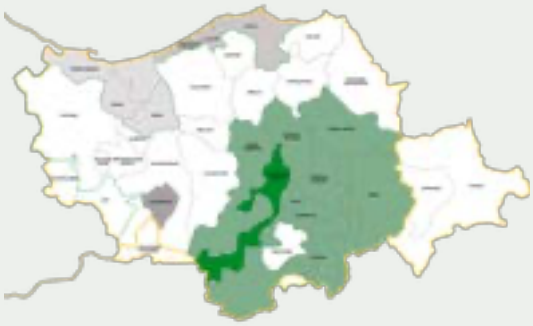
Agriculture is the main source of income for the inhabitants of Bompietro. The predominant crops are cereals and forage, while the lower areas of the land feature extensive plantations of olive trees, almond trees, and vineyards. These agricultural activities not only support the local economy but also help preserve the rural landscape and the traditions that define the identity of the area.

from Comune di Alimena. (2024). Comune di Alimena. https://www.comune.alimena.pa.it/sito/

Castellana Sicula

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	3.014 abitanti (01/01/2023 - Istat)
Area	73,20 km²
Density	41,18 ab./km²



Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.835

Geographic data

Altitude	765 m a.s.l. - minimum: 341 - maximum: 1.900
Geographical Coordinates	*sexagesimal system* 37° 47' 9,24" N - 14° 2' 24,72" E *decimal system* 37,7859° N - 14,0402° E

History

The municipality of Castellana Sicula was established in 1947, following the separation from the territory of Petralia Sottana, and today it is an integral part of the Madonie Park. The first traces of urban settlements date back to the first half of the 17th century, when farmers and agricultural workers from surrounding towns, including the prosperous Petralia, identified the fertile plain where Castellana would later be founded as an ideal place for cultivation. Although the exact date of the town's foundation is uncertain, it is estimated to have occurred between the 17th and 18th centuries, probably between 1650 and 1713, the year when the Spanish ceded their Sicilian domains to the Austrian Habsburgs with the Treaty of Utrecht. During this period, the Duke of Ferrandina, feudal lord of the estates of Castellana, Fana, and Maimone, obtained from King Philip V of Spain the ius populandi, the right to establish new villages. It is believed that, following the marriage of the duke to Gemma, a noblewoman from the Spanish family of Castellana (also known as Castelletti, Castellitti, or Incastilletta, originally from Catalonia), the town was named Castellana in honor of his wife. The culture and local traditions of Castellana Sicula are still alive and actively participated in today. For example, in August, the local folk group performs the ballo della cordella, an ancient fertility dance involving 24 dancers. Each dancer holds one end of a ribbon tied to the top of a 3-meter-high pole, weaving and untangling the ribbons in a traditional choreography. Another significant event is the Carnival of the Madonie, held on the Sunday before Shrove Tuesday, which enlivens the community of Castellana Sicula with celebrations and parades of masks. These traditions help maintain a strong connection with the past, preserving and celebrating the cultural identity of the area.

from Comune di Castellana Sicula. (2024). Comune di Castellana Sicula. https://www.comune.castellana-sicula.pa.it/

Gangi

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	6.107 abitanti (01/01/2023 - Istat)
Area	127,46 km²
Density	47,91 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	2.179

Geographic data

Altitude	1.011 m a.s.l. - minimum: 408 - maximum: 1.333
Geographical Coordinates	*sexagesimal system* 37° 47' 48,12'' N - 14° 12' 18,72'' E *decimal system* 37,7967° N - 14,2052° E

History

Known as Ganci in Sicilian, Gangi is an Italian municipality with a population of 6,183 inhabitants, located in the metropolitan city of Palermo, Sicily. The earliest findings in the territory of Gangi date back to the Early Bronze Age, during the period characterized by the Castelluccio culture. Necropolises with rock-cut tombs have been discovered at the sites of Serra del Vento and in the areas of Regiovanni and Zappaiello, about ten kilometers from the present town center. Gangi has long been associated with the legendary Cretan city of Engyon, located near Gangivecchio or Monte Alburchia. The earliest archaeological evidence seems to confirm this identification.

The history of Gangi dates back to the 12th century, when it was located at the original site of Contrada Gangivecchio. In 1299, during the War of the Sicilian Vespers, Frederick III destroyed the town, but it was subsequently rebuilt on Monte Marone. The first historical documents attest to the existence of Gangi in the 12th century, when it was included in the possessions of the County of Geraci. In 1195, Henry VI of Swabia granted the territories of the county, including the land of Gangi, to the de Craon family, represented by Countess Guerrera. From the 13th century, the County of Geraci passed under the rule of the noble Ventimiglia family. In the 16th century, Gangi, along with the rest of Sicily, became part of the Spanish Empire and was subject to the Inquisition. In 1625, a member of the Graffeo Maniaci family purchased the territory of Gangi from the Ventimiglia family, obtaining the title of Prince of Gangi in 1629 from Philip IV of Spain. The title remained with the Graffeo family until 1652, when it passed to the Prince of Valguarnera through marriage, and his family held the title until the 19th century. In the 18th century, academies were founded in Gangi, the most notable of which was called degli Industriosi, affiliated with the Masonic world. The Church of the Badia was built during this century, attached to the Benedictine Monastery. Gangi was involved in the period of the Spanish Inquisition, and the town was the site of a notable episode during the Siege of Gangi on January 1, 1926, led by Prefect Cesare Mori, who conducted a raid on the town in search of bandits, mafiosi, and fugitives. During the 18th century, Gangi was also home to the Academy of the Industriosi, a center for Masonic recruitment, with active Jansenist propaganda. This period saw a convergence between the Masonic and Jansenist worlds from an anti-curial perspective. The coat of arms of Gangi depicts a Minotaur drinking at a spring, referencing the legend that the city of Engyon, from which Gangi is said to have originated, was founded by Cretan soldiers on a mountain where the ancient Engio River flowed. The banner is a cloth parted white and blue.

from Comune di Gangi. (2024). Comune di Gangi. https://www.comune.gangi.pa.it/

Geraci Siculo

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	1.707 abitanti(01/01/2023 - Istat)
Area	113,35 km²
Density	15,06 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	E
Degree Days	2.282

Geographic data

Altitude	1.077 m a.s.l. - minimum: 180 - maximum: 1.660
Geographical Coordinates	*sexagesimal system* 37° 51' 38,88'' N - 14° 9' 15,84'' E *decimal system* 37,8608° N - 14,1544° E

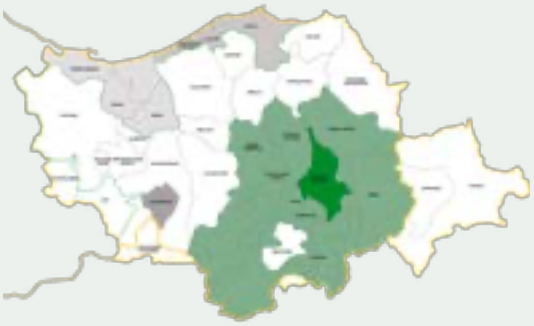
History

Known as *Jiraci* in Sicilian, Geraci Siculo is an Italian municipality with a population of 1,702 inhabitants, located in the metropolitan city of Palermo, Sicily. In 1338, the territory of Geraci Siculo was the site of a fierce battle between Pietro II of Sicily and Francesco I Ventimiglia. The town is part of the Madonie Park and holds the recognition of the club "I Borghi più Belli d'Italia". Additionally, it has been awarded the "Comune Fiorito" quality mark.
Geraci Siculo is an ancient town with an urban layout dating back to the Middle Ages. Agriculture and pastoralism are the main economic activities, along with a plant dedicated to the collection and bottling of mineral water from the springs of the Geraci mountains. The town is known for its traditions, including the Thanksgiving festival dedicated to Saints Bartolo and Giacomo and the Crucifix Festival. A significant event is the medieval costume joust called "Giostra dei Ventimiglia". The territory of Geraci Siculo has a history that dates back to prehistoric times, as evidenced by the artifacts on display at the Minà Palumbo Museum in Castelbuono and the Archaeological Museum in Palermo. The Greek colonization after 550 BC gave the settlement the name Jerax (Ιέραξ in Greek, meaning "buzzard") due to the presence of buzzards in the Rocca. In 241 BC, Geraci was an important Roman settlement, thus entering the cultural sphere of the Greco-Roman and later Byzantine worlds. During the Early Middle Ages, the area of Geraci continued to be inhabited. Reliable information about Geraci dates back to 840 AD, during the Saracen conquest. The Castle, which had been expanded and fortified before the Saracen domination, became even more so. After the division of Sicily into three Muslim provinces, the Madonie, including Geraci, was part of the first province, maintaining its faith and coexisting peacefully with the Islamic element. With the Norman conquest, the town of Geraci was granted as a fief to Riccardo Serlo II of Altavilla by Roger I after the Battle of Cerami. Over time, the county passed to the Ventimiglia family. In 1258, Enrico II Ventimiglia became the Count of Geraci after marrying Countess Isabella. The Ventimiglia family ruled the county until the abolition of feudalism. During the reign of Conrad II, the county expanded to include Collesano, Petralia Superiore and Inferiore, Gratteri, and Isnello. The county gradually became a "state within a state", administering justice and minting its own coins. In 1813, Prince Giuseppe Ventimiglia of Belmonte was arrested for defending the constitution and the freedom of the Kingdom of Sicily. In the following years, Geraci lived a political and administrative life similar to other towns in the Sicilian hinterland. The Ventimiglia family, the last remaining branch, continues to take an interest in the fate of the County to this day.
from Comune di Geraci Siculo. (2024). Comune di Geraci Siculo. https://www.comune.geracisiculo.pa.it/it

Petralia Soprana

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	2.973 abitanti(01/01/2023 - Istat)
Area	56,10 km²
Density	52,99 ab./km²



Seismic and climatic classification

Seismic Zone	2
Climatic Zone	E
Degree Days	2.382

Geographic data

Altitude	1.147 m a.s.l. - minimum: 532 - maximum: 1.657
Geographical Coordinates	*sexagesimal system* 37° 48' 5,76" N - 14° 6' 30,24" E *decimal system* 37,8016° N - 14,1084° E

History

Petralia Soprana, also known as "*A Suprana*" in Sicilian dialect, is an Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 2,975 inhabitants. This picturesque town, an integral part of the Madonie Park, is distinguished for being the highest municipality within the Madonie mountain range and one of the highest in all of Sicily. Included in the "Borghi più Belli d'Italia" circuit, Petralia Soprana was awarded the prestigious title of "Borgo dei borghi 2018", a recognition that highlights its charm and historical-cultural value.
The territory of Petralia Soprana, located on the southern slope of the Madonie, is characterized by the presence of the Salso River and a variety of natural landscapes, ranging from forests and Mediterranean scrub to pastures, arable lands, and tree plantations. The municipality's altitude ranges from 600 meters to 1,657 meters at Pizzo Corvo, contributing to its privileged location and varied climate. According to Diodorus Siculus, Petralia Soprana is identified with Petra, an ancient Sican city. During the First Punic War, in 254 BC, the town came under Roman rule following the conquest of Palermo, becoming one of the primary suppliers of grain to Rome. In the 9th century, during the reign of the Aghlabids, the town was renamed Batraliah, reflecting the Arab influence on the region.
The Norman conquest in 1062 marked a new chapter in Petralia Soprana's history, with the fortification of the town through the construction of castles, towers, and churches. In 1258, the two distinct areas of Petralia Inferiore and Petralia Superiore became part of the heritage of the Ventimiglia Counts of Geraci Siculo and later passed under various dominations until the abolition of feudalism in 1817. The municipal coat of arms of Petralia Soprana, granted in 1993, symbolizes the two souls of the town: a cardo (a thistle) from the Madonie mountains, representing the local flora, and a silver tower walled in black, emblematic of its fortified history and its deep-rooted identity in the past.
from Comune di Petralia Soprana. (2024). Comune di Petralia Soprana. https://comune.petraliasoprana.pa.it/

Petralia Sottana

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	2.477 abitanti(01/01/2023 - Istat)
Area	178,34 km²
Density	13,89 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	E
Degree Days	2.162

Geographic data

Altitude	1.000 m a.s.l. - minimum: 340 - maximum: 1.977
Geographical Coordinates	*sexagesimal system* 37° 48’ 37,80’’ N - 14° 5’ 35,88’’ E *decimal system* 37,8105° N - 14,0933° E

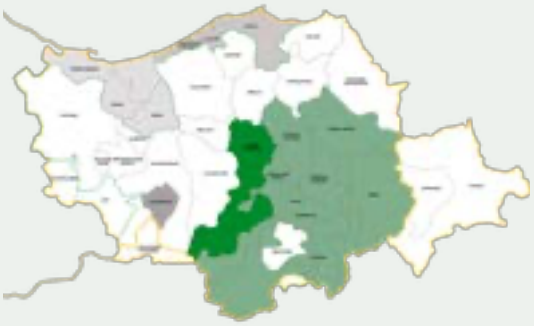
History

Known as *Pitralìa Suttana* in Sicilian, Petralia Sottana is an Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 2,472 inhabitants.
Situated in the Madonie Park and part of the Bandiera Arancione circuit, the town lies on the southern slope of the Madonie mountain range, in the upper valley of the Imera Meridionale River, developing on a slope between 900 and 1100 meters above sea level.
The municipal territory, covering 178 km², is predominantly mountainous and extends in latitude from the ridge of the Madonie chain to the north, reaching the province of Caltanissetta to the south.
In the northern part, within the Madonie Park, there are extensive forests of broadleaf trees and conifers, as well as large areas designated for grazing.
In the southern part, extensive cultivation predominates. Classified in the Agrarian Region 3 ("Inner Mountain - Eastern Madonie"), the municipality is considered a seismic zone of type "2" (medium-high seismicity).
The climate is typically Mediterranean-mountain, with cold and rainy winters, heavy snowfall, and hot, dry summers.
The first traces of human settlement date back to the 4th/3rd millennium BC.
In the 3rd century BC, with the Roman conquest, Petra became a "decuman" city and an important military and agricultural market center. With the Arab conquest in the 9th century, the town was renamed Batarliah or Batraliah, becoming a strategic military stronghold and a market with various ethnic-religious communities.
The Normans conquered Petralia around 1062, founding a castle.
Over the following centuries, the town followed the island's fate, enduring barbarian invasions, Byzantine reconquests, and changes in rule. The civic coat of arms features the Lily of Rock, a golden lily on a red background, possibly linked to the town's name origin (Lilium Petrae).
The coat of arms is topped with a city crown and includes a scroll with the motto "Lilium Petrae." It was granted by decree of the President of the Italian Republic on July 27, 1993.
from Comune di Petralia Sottana. (2024). Comune di Petralia Sottana. https://www.comune.petraliasottana.pa.it/

Polizzi Generosa

II.1.4.1 High Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	2.913 abitanti (01/01/2023 - Istat)
Area	134,66 km²
Density	21,63 ab./km²



Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	2.037

Geographic data

Altitude	920 m a.s.l. - minimum: 362 - maximum: 1.869
Geographical Coordinates	*sexagesimal system* 37° 48’ 46,44” N - 14° 0’ 15,12” E *decimal system* 37,8129° N - 14,0042° E

History

Known in Sicilian as *Pulizzi*, Polizzi Generosa is an Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 2,979 inhabitants.
Situated within the Madonie Park, the town boasts an ancient history, dating back to the 6th century BC, as evidenced by numerous archaeological finds, including an anepigraphic coin from Himera. Over the years, Punic artifacts and a necropolis from the Classical and Hellenistic periods have been discovered and studied, enriching the understanding of Polizzi Generosa’s history.
In the 4th century BC, Polizzi Generosa gained significance due to its strategic location along the border between the Punic and Syracusan territories. During this period, the town hosted a permanent garrison and a fortress manned by mercenary troops of Campanian origin. Roman remains found in the area confirm the historical importance of Polizzi Generosa. The toponym "Polizzi" has Greek or Byzantine origins and is derived from a compound place name ending in "Polis" (city). The evolution of the name from Polis to Polizzi is well-documented in the various spellings found in Norman-era documents. Contrary to some theories, the name "Polizzi" does not derive from two noble families of the same name, as the toponym predates the adoption of those surnames.
Polizzi Generosa thrived under Arab rule for nearly two centuries and maintained its prosperity during the Angioine period, later becoming a royal town. However, the town began to decline due to the devastating plague of 1575-76, which decimated the population.
Despite this, in the 19th century, there was a revival of commercial activities. The epithet "Generosa" was granted by Frederick II, who was impressed by the hospitality he received during his visit. This name was officially recognized in 1863 with Royal Decree No. 1218, thereby formalizing the full name of Polizzi Generosa.
from Comune di Polizzi Generosa. (2024). Comune di Polizzi Generosa. https://www.comune.polizzi.pa.it/

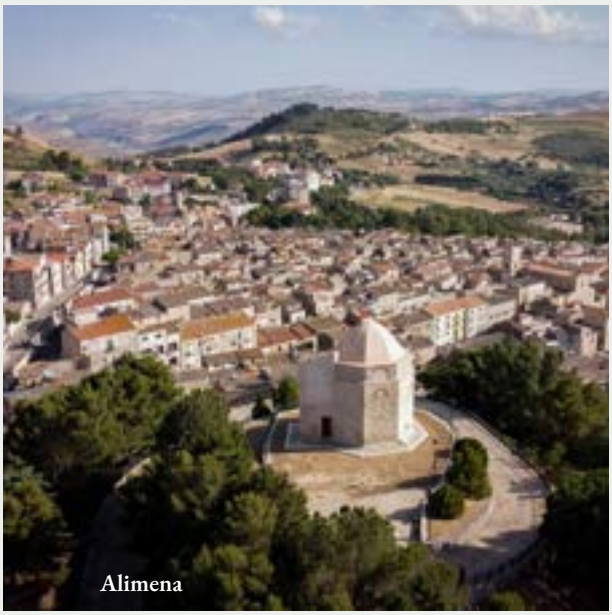
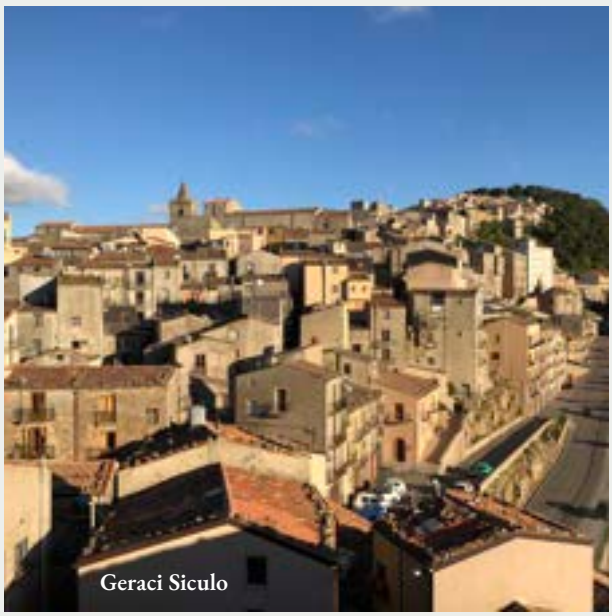


Fig. II.1.4.1.2 | High Madonie. ©Luisa Lombardo, 2022

Blufi

Castellana Sicula


Geraci Siculo

The High Madonie area is a region that includes the municipalities located at higher altitudes and covers a total area of 1,176.52 square kilometers. This area is characterized by a population of about 30,000 inhabitants, with a relatively low average density of around 31 inhabitants per square kilometer, reflecting the predominantly rural and mountainous nature of the territory. Currently, this part of the district consists of 11 municipalities, some of which were added more recently, in 2024, such as Alia and Valledolmo, which are part of the Province of Palermo.

- **Alia:** 3.909 inhabitants;
- **Alimena:** 2.138 inhabitants;
- **Blufi:** 1.058 inhabitants;
- **Bompietro:** 1.460 inhabitants;
- **Castellana Sicula:** 3.489 inhabitants;
- **Gangi:** 6.993 inhabitants;
- **Geraci Siculo:** 1.907 inhabitants;
- **Petralia Soprana:** 3.416 inhabitants;
- **Petralia Sottana:** 2.938 inhabitants;
- **Polizzi Generosa:** 3.543 inhabitants;
- **Valledolmo:** 3.716 inhabitants.

This territory, due to its particular geographical configuration and the distribution of the main road axes, often lacks natural connections to neighboring municipalities situated along the coastal strip, especially due to the proximity of the A/20 motorway, which links the municipalities of Cefalù and Pollina with the cities of Palermo and Messina. This road axis represents an important communication route for the transport of people and goods, facilitating access to larger markets and the main communication routes of the island.

The High Madonie area is one of the most peripheral regions in the SNAI strategy due to its distance from essential services. Because of its "inaccessibility," the district—and specifically this area—has preserved the identity features of the past; it is the most authentic but also the most difficult to reach. In detail, the municipalities are geographically very close, yet reaching them via the existing connections requires at least an hour and a half by car.

Fig. II.1.4.1.2 | High Madonie. ©Luisa Lombardo, 2022

Castelbuono

II.1.4.2 Low Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	8.123 abitanti (01/01/2023 - Istat)
Area	60,79 km²
Density	133,63 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	C
Degree Days	1.321

Geographic data

Altitude	423 m a.s.l. - minimum: 70 - maximum: 1.633
Geographical Coordinates	*sexagesimal system* 37° 55’ 58,80” N - 14° 5’ 21,84” E *decimal system* 37,9330° N - 14,0894° E

History

Castiḍḍubbonu in Sicilian, the settlement is located on the slopes of Mount Milocca. In ancient times, the first traces of settlement date back to the Neolithic period (3rd millennium BC), with domestic tools and polished stone weapons likely attributed to the Sican population. During the Greek colonization period, the poetic figure of the shepherd Dafni, born in the Madonie, stands out. Moreover, archaeological finds from the Greco-Roman civilization have been discovered in the necropolis of Bergi. In the medieval era, the existence of a farmhouse called Ypsigro is recorded during the Byzantine period, interpreted as a cool area at medium altitude. The origins of Castelbuono date back to the early 14th century when the Ventimiglia family, lords of the County of Geraci, decided to build a castle on the hill overlooking the ancient farmhouse of Ypsigro. During the Islamic and Norman periods, ruins of buildings were found at San Guglielmo, traces of a necropolis, the tradition of an old mosque, and other elements from this time. The area of Castelbuono seems to coincide with the location of Riqqat Basili, mentioned by al-Idrisi in the 12th century. The first document confirming the name of Castelbuono dates back to 1329, a notarized deed in which Count Francesco Ventimiglia declares that he holds the forest and lands of S. Maria di Bisanzio in the territory of Castri Boni. The official founding of the castle, and therefore the town, is documented by a plaque on the entrance arch of the castle dated 1317. Over the centuries, the Ventimiglia family ruled the County of Ypsigro, extending its control until the 20th century. In the 15th century, Giovanni I Ventimiglia, Marquis of Geraci, moved his "court" to Castelbuono, contributing to the cultural and economic revival of the area. In 1595, Giovanni III Ventimiglia obtained the title of Prince of Castelbuono, and the town became the "capital of the State of Geraci." In 1812, with the abolition of feudal privileges, a new era began for Castelbuono, with the emergence of new noble families such as the Guerrieri, Collotti, and Galbo families. In the 19th century, the town participated in uprisings against the Bourbons in 1848 and 1860, receiving praise from Giuseppe Garibaldi. In the contemporary period, Castelbuono experienced the events of both World Wars, and in 1943, Captain Kelly established the first municipal council after the liberation from fascism. Castelbuono is a town rich in history and culture, with a community that has significantly contributed to the economic and cultural development of the region. In 1946, the town made the transition to the Republic, electing its first post-war mayor, Filippo Bonomo. The town's coat of arms and banner were granted in 2010, with the coat of arms depicting a golden castle on a blue background, walled in black, with three towers.
from Comune di Castelbuono. (2024). Comune di Castelbuono. https://www.comune.castelbuono.pa.it/

Collesano

II.1.4.2 Low Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	3.656 abitanti (01/01/2023 - Istat)
Area	108,16 km²
Density	33,80 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	C
Degree Days	1.379

Geographic data

Altitude	468 m a.s.l. - minimum: 18 - maximum: 1.656
Geographical Coordinates	*sexagesimal system* 37° 55’ 9,84” N - 13° 56’ 11,40” E *decimal system* 37,9194° N - 13,9365° E

History

Also known as *Ulisanu* in Sicilian, Collesano is an Italian municipality with a population of 3,656 inhabitants, located in the metropolitan city of Palermo in Sicily. The town is home to the museum dedicated to the famous automobile race, the Targa Florio, of which it is one of the main passage points. Furthermore, Collesano is part of the picturesque Madonie Park.

The settlement of Collesano develops along the slope of a large valley situated at the foot of the carbonate relief "Poggio Grotta del Signore" (897 m above sea level), bordered by the Mora stream to the north and the Zubbio stream to the west, which converge downstream into the Roccella torrent.

The municipal territory, part of which is included in the Madonie Park, is located on the north-western slope of the western Madonie mountain range. The surrounding peaks, such as Monte Castellaro (1,656 m), Monte Cucullo (1,311 m), Pizzo Giammarusa (1,064 m), and Monte d’Oro (808 m), characterize the landscape of the area with their distinctive morphological and vegetation features.

From a historical perspective, according to Michele Amari, an early urban settlement may correspond to the site mentioned by the Arab geographer Al Muqaddasi in the 10th century, referred to as Qal’at as-sirat ("fortress on the right path"). The area has yielded prehistoric artifacts, such as ceramics dating back to the 7th century BC.

After the Norman conquest, under the name of Golisano, the present-day Collesano emerged as the center of a vast feudal estate extending between the Roccella torrent and the interior of the Madonie, initially granted to Rainolfo, the grandson of the great Count Roger. On the initiative of Roger II, King of Sicily, the fortified center was destroyed and rebuilt on its current site, assigned in feudal tenure to Adelicia of Adernò, the king’s granddaughter (1140).

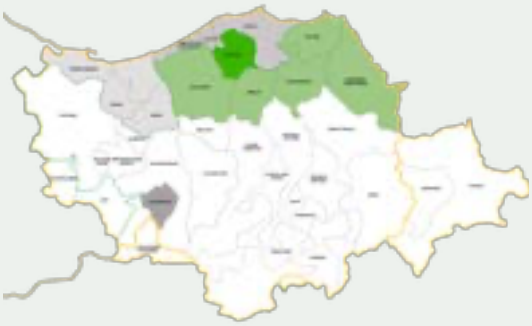
Collesano is mentioned in the "Libro di Ruggero" by the Arab geographer Idrisi as a fortified center destroyed by Roger II and later rebuilt on its present location. From the 13th century, it belonged to the Siracusa family and later to the Ventimiglia family, who ruled over the County of Madonie. Over time, the locality passed into the possession of the Centelles, Cardona, Aragona, Moncada, and finally Ferrandina di Toledo families, the last feudal lords before the abolition of feudalism in Sicily in 1812.

from Comune di Collesano. (2024). Comune di Collesano. https://www.comune.collesano.pa.it/

Gratteri

II.1.4.2 Low Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	859 abitanti (01/01/2023 - Istat)
Area	38,17 km²
Density	22,51 ab./km²



Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.734

Geographic data

Altitude	657 m a.s.l. - minimum: 70 - maximum: 1.379
Geographical Coordinates	*sexagesimal system* 37° 57’ 59,76” N - 13° 58’ 23,16” E *decimal system* 37,9666° N - 13,9731° E

History

Gratteri in Sicilian is a small town in the Madonie that offers a panoramic view of the Tyrrhenian coast from the mountainous region located southwest of Cefalù. The origins of the toponym have led to several hypotheses; according to Maurolico, the town could derive from the mountain called Cratos, while another interpretation suggests a possible reference to the Crati stream. The earliest traces of settlement in the area probably date back to the late Bronze Age or the early Iron Age, as evidenced by the discovery of archaeological finds.
During the Norman period, with the arrival of Robert Guiscard in 1059, Count Roger I of Altavilla brought a new economic, social, legal, and administrative structure to Sicily. In this context, Gratteri played a significant role with the establishment of the abbeys of Sant'Anastasia and San Giorgio, and the construction of the churches of Sant'Elia, San Nicolò, and Sant'Icono. The first lord of Gratteri, as recorded in a diploma from Countess Adelasia in 1112, was William. Later, the fief passed to the lords of Monforte until 1250, when Manfred, son of Frederick II, assigned the lands of Gratteri and Isnello to the metropolitan church of Palermo. The fief then passed to the Ventimiglia family, which clashed with the bishop of Cefalù for control of the Roccella loading point. During the Aragonese period, Gratteri was the site of conflicts between the troops of King Peter II and the Sicilian army led by the Ventimiglia family. In the 15th century, under Alfonso of Aragon, the Ventimiglia family began the barony of Gratteri, which influenced the life of the community in the following centuries. From an urbanistic perspective, according to a description from 1645 by Benedetto Passafiume, the town was divided into an older nucleus, with a castle and walls, and a newer nucleus that developed from the 15th century onward. The medieval center was organized around the castle, positioned on the rock of San Vito, with an irregular road layout. The city walls have disappeared, but the eastern layout is still visible on the edge of the stream. The main access routes were those coming from the county of Collesano. Over time, the area near the church of San Leonardo developed, with the construction of new churches and the expansion of the settlement. The church of San Michele Arcangelo, built in the mid-14th century, became the new center of the town. In the 15th century, the church of San Sebastiano prompted a new expansion of the settlement to the southeast of the castle, with the districts "di lu sciumi," "di Fantina," and "di San Sebastiano." Later, the arrival of the Franciscan friars in the 16th century led to a new expansion to the northeast, giving rise to the "new part" of the town.
from Comune di Gratteri. (2024). Comune di Gratteri. https://www.comune.gratteri.pa.it/

Isnello

II.1.4.2 Low Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	1.310 abitanti (01/01/2023 - Istat)
Area	51,00 km²
Density	25,69 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.504

Geographic data

Altitude	530 m a.s.l. - minimum: 295 - maximum: 1.977
Geographical Coordinates	*sexagesimal system* 37° 56’ 42,00’’ N - 14° 0’ 23,76’’ E *decimal system* 37,9450° N - 14,0066° E

History

Isineḍḍu in Sicilian is an Italian municipality with a population of 1,306 inhabitants, located in the metropolitan city of Palermo, Sicily. The territory of Isnello is characterized by significant karst features, with numerous cavities between Pizzo Dipilo and Pizzo Carbonara. In the area of Cozzo Balatelle, there is the “Abisso del Vento” cave, a deep, largely unexplored cavity adorned with stalactites and stalagmites. The origin of the town's name has been the subject of debate over time, but although no definitive conclusion has been reached, it is believed to derive from the characteristics of the watercourse that crosses the entire territory. Etymological hypotheses include the Syriac word “hassin,” meaning cold river, the Punic “hassinor,” referring to a stream flowing in a tubular-shaped bed, and the Greek “asines,” indicating the harmlessness of the stream. Information on the history and evolution of the settlement during the Roman period and the early Christian centuries is limited. During this time, the area of Isnello was known as Menzil Al-Hamàr, meaning fortified village. After the defeat of the Arabs, Count Roger founded the new town of Isnello, which was incorporated into the Diocese of Messina, remaining under Roger's direct control. Roger II, the first King of Sicily, included Isnello in the new diocese founded in 1131 with the Cathedral of Cefalù. The domain over Isnello and the nearby Gratteri was temporarily granted by Emperor Frederick II to the Archbishop of Palermo, who later requested his son Manfred to permanently grant the governance of the two baronies to the Palermitan Church. The reason for the loss of jurisdiction by the Church of Palermo over the two centers is not known.
In 1296, the barony of Isnello was sold by Niccolò Abbate to Francesco II Ventimiglia and Consolo, Count of Geraci. Later, due to a crime of treason, Antonio Ventimiglia lost his rights over the lands, which passed to the royal treasury. In 1397, King Martin granted the barony of Isnello to Abbo Filangeri, Alcaide of Cefalù, who later ceded it for the County of San Marco. In 1788, the citizens of Isnello, tired of the control exercised by the counts, repurchased the territories of the county, freeing themselves definitively from baronial authority. From a heraldic perspective, the municipal coat of arms of Isnello is a shield on a red background topped with a crown with three towers, divided into four sections. The first section depicts a silver flying eagle crowned with the same, the second is blue with a golden band and two golden six-pointed stars, the third is golden, and the fourth is blue with a golden six-pointed star. The mural crown is golden. The second field displays the arms of the noble Termini family, which inherited the county of Isnello from Donna Giuseppa Valguarnera, the last direct descendant of the Santacolomba family.
from Comune di Isnello. (2024). Comune di Isnello. https://www.comune.isnello.pa.it/

Pollina

II.1.4.2 Low Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	2.850 abitanti (01/01/2023 - Istat)
Area	49,93 km²
Density	57,08 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.800

Geographic data

Altitude	730 m a.s.l. - minimum: 3 - maximum: 762
Geographical Coordinates	*sexagesimal system* 37° 59' 40,92" N - 14° 8' 45,96" E *decimal system* 37,9947° N - 14,1461° E

History

Pùḍḍina in Sicilian, Pollina is an Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 2,853 inhabitants. Situated within the Madonie Park, the municipal territory of Pollina includes the settlements of Pollina and Finale, as well as the areas of Costa Turchina, Nastasi, and Rais Gerbi. Most of the population resides in the village of Finale.

One of the most important economic activities for Pollina and the entire Madonie Park is the cultivation of ash trees for the production of manna, a product recognized by Slow Food as a traditional safeguard.

Manna is a traditional product with deep historical roots in the local area. Some historians speculate that Pollina may be the modern successor of Apollonia, an ancient city of Magna Graecia, although no archaeological findings have confirmed this theory. In 1321, the Bishop of Cefalù granted the locality to Count Francesco Ventimiglia, whose family maintained the barony until the abolition of the feudal system in the early 19th century.

Tourism development in Pollina began in the 1970s, with the creation of an open-air theater known as "Pietrarosa," designed by architect Foscari. This theater, carved from a dolomitic rock and inspired by the lines of a Greek theater, represents a unique feature in the Mediterranean.

Pollina is the only place where the knowledge and technique for producing manna have been preserved.

During the summer, a liquid is collected from the trunks of ash trees through incisions, and when exposed to air, it condenses and turns into manna. This product, known as "dew honey" or "ash honey," was used in medicinal preparations by the Greeks and Romans in antiquity. The Arabs, on the other hand, attributed spiritual properties to manna, considering it blessed because it is mentioned in the Quran.

da Comune di Pollina. (2024). Comune di Pollina. https://www.comune.pollina.pa.it/

San Mauro Castelverde

II.1.4.2 Low Madonie

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	1.345 abitanti (01/01/2023 - Istat)
Area	114,37 km²
Density	11,76 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	E
Degree Days	2.240

Geographic data

Altitude	1.050 m a.s.l. - minimum: 9 - maximum: 1.346
Geographical Coordinates	*sexagesimal system* 37° 54’ 59,40’’ N - 14° 11’ 25,44’’ E *decimal system* 37,9165° N - 14,1904° E

History

Santu Màuru in Sicilian is an Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 1,346 inhabitants. The settlement lies on the homonymous mountain at about 1,050 meters above sea level, surrounded by the Madonie to the west and the Nebrodi to the east. To the north, it overlooks the Tyrrhenian Sea, with views of local landscapes and neighboring towns like Pollina, Castelbuono, Gangi, and Geraci Siculo.
The municipality is part of the Madonie Park and is located about 114 km from the provincial capital. Under the title "Santo Mauro," the town has a history dating back to the Norman era and was recorded among the manors of the County of Geraci in the diocese of Messina. The name “San Mauro” may derive from the donation of a relic of the saint by the Benedictine monks of a convent located in the area. The appellation “Castelverde” was added in 1863 to distinguish the town from other Italian places with the same name.
This decision was made after the unification of the Kingdom of Italy, when the Prefecture of Palermo requested the addition of a second name. The City Council decided on the name “Castelverde” on December 16, 1862.
The ancient history of San Mauro Castelverde, blending with millennia-old legends passed down orally, draws from the works of local authors such as La Rocca and Leonarda for greater reliability. It is believed that the first inhabitants were the Greeks, as indicated by ancient watering holes and roads.
The Byzantine period is represented by the Church of Santa Sofia or Monte. The first fortifications and the castle, likely of Norman origin, were linked to the Ventimiglia family from 1296 to 1812. The legend of “Pietro Verde” tells the story of a noble feudal lord who took refuge in Sicily in the 8th century.
In the medieval era, after the Saracen occupation, San Mauro passed to the diocese of Messina and became part of the Aragonese kingdom after the Sicilian Vespers revolution in 1282. In modern times, the town rebelled against the Ventimiglia family in 1492, obtaining privileges on market days.
Over the years, San Mauro Castelverde has gone through various political phases, including the Bourbon period and the Zanardelli Law of 1890, which led to the suppression of the Pretura (local court).
da Comune di San Mauro Castelverde. (2024). Comune di San Mauro Castelverde. https://www.comune.sanmauro-castelverde.pa.it/

Fig. II.1.4.1.3 | Low Madonie. ©2021, Luisa Lombardo.

Aliminusa

II.1.4.3 Madonie Imeresi

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	1.055 abitanti(01/01/2023 - Istat)
Area	13,68 km²
Density	77,12 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	C
Degree Days	1.326

Geographic data

Altitude	450 m a.s.l. - minimum: 120 - maximum: 1.133
Geographical Coordinates	*sexagesimal system* 37° 51’ 54,00” N - 13° 46’ 55,56” E *decimal system* 37,8650° N - 13,7821° E

History

Larminusa in Sicilian, overlooks the opposite side of Mount San Calogero, also known as Euracus (1,326 m). The toponym "Aliminusa" first appears in the 1333 will of Matteo Sclafani, where he declares that he had purchased the fief and the farm of Rachalminusa (the prefix "rachal" in Arabic means farm or village) from the son of Gualtiero Fisaula, Giovanni. This event is documented in the deed drafted by Giovanni di Siracusia. From the first half of the 14th century, Rachalminusa follows the events of the County of Sclafani. Initially owned by Matteo Sclafani, Count of Adernò, the fief later passes to his daughters Luisa and Margherita, who are respectively married to Guglielmo Peralta and Guglielmo Raimondo Moncada. After a *brief* period during which the county is granted to the Moncada family by King Martin, it returns under the control of the Peralta family in 1396, when Nicolò Peralta gains the right to exercise the "mero and misto imperio" (the right to administer justice) over the entire County of Sclafani. In the 15th century, a map preserved in the Uffizi Gallery titled “Terrae harminusae” refers to the fief of Rachalminusa, distorted as “harminusae” by the locals. In the 1400s, Sancho Ruiz de Lihori, son of the governor of Aragon, acquires the County of Sclafani in 1400. However, in the early years of the following century, he cedes the county to Don Giacomo de Prades, who in turn sells it in 1406 to Enrico Rubbes (Russo), Baron of Caltavuturo. After some hereditary vicissitudes, in 1442 the County of Sclafani passes to Antonio Spatafora Russo. In the 1500s, during the reign of John II, the Luna family is exiled from the kingdom, and their property is confiscated to avoid conflicts with the Perollo family during the first Sciacca Case. In 1519, Gian Vincenzo de Luna invests in the County of Sclafani. In the 1600s, the government grants barons the right to establish new settlements in their fiefs. In 1620, the County of Sclafani is dismantled, leading to the formation of the municipalities of Aliminusa, Scillato, Sclafani, and Valledolmo. In the 1700s, large estates and the socioeconomic gap become evident in Sicily. Most of the land is divided into large estates and noble fiefs, contributing to the poverty of the population. The fief of Aliminusa passes through various hands over the centuries, including the Cutelli, Recupero, and eventually the Milone families. In 1750, the fief is granted to Prince Ignazio Vincenzo Paternò, Prince of Biscari, who subsequently transfers it to Gerolamo Recupero and Bonaccorsi in 1766. The barony and land of Aliminusa then pass to his brother Giuseppe Recupero and Zappalà in 1796. The 19th century is marked by attempts at agrarian reforms, including land redistribution, to address the issue of large estates and widespread poverty. *from Comune di Aliminusa. (2024). Comune di Aliminusa. https://www.comunedialiminusa.it/*

Caccamo

II.1.4.3 Madonie Imeresi

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	7.681 abitanti (01/01/2023 - Istat)
Area	188,23 km²
Density	40,81 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.531

Geographic data

Altitude	521 m a.s.l. - minimum: 79 - maximum: 1.311
Geographical Coordinates	*sexagesimal system* 37° 56' 1,32'' N - 13° 39' 56,88'' E *decimal system* 37,9337° N - 13,6658° E

History

Known also as *Càccamu* in Sicilian, the municipality is a member of the Union of Municipalities of the Lower Valley of the Torto River. The town of Caccamo is located at the foot of Mount San Calogero, in the lower section of the former San Leonardo River Valley, now known as the Rosamarina Lake. The lake, with a capacity of around 100 million cubic meters of water, is the main water resource in the Palermo region. Caccamo is surrounded to the east by the Monte San Calogero Nature Reserve, to the west by the Pizzo Cane, Pizzo Trigna, and Grotta Mazzamuto Nature Reserve, and overlooks the Tyrrhenian Sea. With an area of approximately 19,000 hectares, Caccamo borders fourteen other municipalities. The origins of Caccamo have piqued the interest of distinguished scholars; according to legend, the city was founded around the 4th-5th century BC by the Carthaginians fleeing after their defeat in 480 BC at Himera. Historical evidence indicates that the area has been inhabited since ancient times, as demonstrated by the oven burials known as "grotticelle" scattered throughout the territory. The period of Arab domination was particularly troubled, marked by the revolt of the Berber people of Girgenti from 939 to 940. The settlement pattern changed during this period, with Petterana as the main nucleus, a decline in the 12th century, and the growth of the Castle. In 1094, the city was granted as a fief to Goffredo de Sagejo, a Norman lord. About fifty years later, it passed to the Bonello family. During the Bonello's rule, the castle underwent expansions and embellishments, becoming a refuge during revolts against King William I. The castle then became royal property until the death of William I, when it passed to Giovanni Lavardino. With the reign of Federico Chiaramonte, the period of economic development began, marked by new monuments and the expansion of the castle. In 1302, Caccamo resisted the assault of the Angioini, and the lordship was elevated to a County, taking the name of Chiaramonte. After various events, in 1641, Caccamo was elevated to city status and experienced a period of prosperity under the Henriquez-Cabrera lordship. The city developed urbanistically, new churches were built, and in 1643 it received all the honors and privileges of other cities in the Kingdom. In 1646, the Amato family took control of the city, elevating the county to a duchy. After the extinction of the Amato family, in 1813 the lordship passed to the De Spuches family. The city actively participated in the events that led to the unification of Italy. In 1967, the Castle was transferred to the Region in exchange for 40 million, marking the beginning of projects to transform it into a cultural institution.
da Comune di Caccamo. (2024). Comune di Caccamo. https://comune.caccamo.pa.it/

Caltavuturo

II.1.4.3 Madonie Imeresi

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	3.558 abitanti (01/01/2023 - Istat)
Area	97,95 km²
Density	36,33 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.664

Geographic data

Altitude	635 m a.s.l. - minimum: 138 - maximum: 1.080
Geographical Coordinates	*sexagesimal system* 37° 49' 19,20'' N - 13° 53' 27,60'' E *decimal system* 37,8220° N - 13,8910° E

History

Cartavuturu in Sicilian, dominated by the Rocca di Sciara, evolved as an ancient stronghold, presumably of Byzantine origin, undergoing various dominations over the centuries. The inhabitants are commonly known as *caltavuturesi* (or *cartavutrisi* in Sicilian). An interesting passage from Diodorus Siculus mentions armed clashes around 306 B.C. between Agathocles and Dinocrates, referring to Mount Gorgium and the center of Ambica. The first might be identified with the mountain above Caltavuturo, while the second would correspond to the current settlement of Sclafani Bagni, both located in the Himera Valley. The presence of a plain called "chiana chianta" by the people of Caltavuturo is an intriguing element, the meaning of which could be "flat plant" or, according to other interpretations, "plain of tears," referring to an ancient battle also narrated in local myths. This detail suggests a possibly older origin than the Byzantine era, although without concrete proof. The dating of the first settlement is unclear over time, but the earliest dated artifacts can be attributed to the Byzantine period, between the 6th and 7th centuries, during the command of George Maniakes, a Byzantine commander and descendant of the Imperial family of Byzantium. According to some theories, the city's origin is linked to the Arab domination, suggesting that the name comes from the Arabic *Qal'at Abī l-Thawr* (fortress of Abū Thawr), the Muslim leader who took control of it. However, this version has historical inconsistencies. Other scholars suggest the name derives from the combination of the Arabic word *qal'at* (fortress) and the Sicilian *vuturu/vuturuni* (vulture/griffin), meaning "Fortress of the Vulture," referring to the endemic bird of prey in the region. In line with this second version, the town's coat of arms depicts a medieval tower with a griffin perched on it. According to the historian Ibn al-Athir, in 811/812 A.D., near present-day Caltavuturo, a battle occurred between Byzantine and Aghlabid forces during the Islamic conquest of Sicily.
During the Norman domination, the town belonged to the family of Count Roger, later passing under the control of the Ventimiglia family during the Swabians. Several families succeeded each other until the 16th century. In 1550, some of the inhabitants moved outside the walls, to a lower altitude than the rocky terrace of the "Terravecchia," which represents the original nucleus. On January 20, 1893, during the revolt of the Sicilian Fasci, 500 farmers who symbolically occupied some lands were dispersed by soldiers and carabinieri, with thirteen protesters losing their lives in the clashes.
da Comune di Caltavuturo. (2024). Comune di Caltavuturo https://www.comune.caltavuturo.pa.it/

Montemaggiore Belsito

II.1.4.3 Madonie Imeresi

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	2.954 abitanti (01/01/2023 - Istat)
Area	32,08 km²
Density	92,10 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.430

Geographic data

Altitude	517 m a.s.l. - minimum: 196 - maximum: 1.145
Geographical Coordinates	*sexagesimal system* 37° 50’ 51,00” N - 13° 45’ 43,56” E *decimal system* 37,8475° N - 13,7621° E

History

Muntimajuri in Sicilian, is an Italian municipality with a population of 2,979 inhabitants, located in the metropolitan city of Palermo, Sicily. The town is 70 km from Palermo. Archaeological finds confirm that the settlement in the area of Montemaggiore Belsito dates back at least to the 12th century, with the presence of a "casale" (small rural settlement). This area was initially controlled by the Byzantines and later by the Arabs during their invasion of Sicily. Based on archaeological findings, it is hypothesized that the Arabs were present in the territory of Montemaggiore. In the second half of the 13th century, like many areas of the island at the time, Montemaggiore was repopulated by mountain farmers from the Madonie following a gradual depopulation resulting from the abandonment of a Cluniac monastery in the area. By the end of the 13th century, Montemaggiore had already been elevated to the status of "terra." Starting in 1410, a Benedictine monastery founded by the Ventimiglia family is mentioned. During this period, Montemaggiore was a feudal estate belonging to Riccardello Filangeri, who had received it from Count Francesco Ventimiglia in the 14th century in exchange for the castle of Sperlinga. From this period until the second half of the 16th century, Montemaggiore showed no significant signs of repopulation. In 1598, Montemaggiore was elevated to "Marquisate" by the grant of King Philip II to Mariano Migliaccio Ventimiglia. Despite its innerlocation, Montemaggiore was involved in the territorial urbanization process of Sicily between the 16th and 18th centuries, especially before 1600, due to the phenomenon of inner migration. In 1624, Montemaggiore had 185 houses and 964 inhabitants, which increased to 303 houses and 1,260 inhabitants in 1652. In the 17th century, the town, with a Benedictine monastery and at least three churches, continued to grow thanks to its vast and fertile territory, attracting the rural population from the surrounding Madonie centers. In 1851, a landslide partially destroyed the town. At that time, "terrene houses," simple in design and used for all functions of living, were predominant, characteristic of the homes of the less affluent. The middle-class bourgeoisie, which would later create less humble housing, emerged only much later in the 18th century. The idea of housing as an expression of social status emerged in the 18th century, but it remained of marginal relevance in Montemaggiore Belsito. Elements that stand out from the urban fabric include the churches, the palace of the Prince of Baucina, and the Saeli Palace, the latter built in the early 20th century. After the Unification of Italy, the name Montemaggiore was modified by adding the term Belsito.
from Comune di Montemaggiore Belsito. (2024). Comune di Montemaggiore Belsito. https://www.comune.montemaggiorebelsito.pa.it/

Scillato

II.1.4.3 Madonie Imeresi

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	593 abitanti (01/01/2023 - Istat)
Area	31,70 km²
Density	18,71 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	C
Degree Days	1.009

Geographic data

Altitude	218 m a.s.l. - minimum: 94 - maximum: 1.794
Geographical Coordinates	*sexagesimal system* 37° 51' 27,36'' N - 13° 54' 25,92'' E *decimal system* 37,8576° N - 13,9072° E

History

Known in Sicilian as *Sciḍḍatu*, Scillato is an Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 618 inhabitants. This village is an integral part of the Madonie Park and is located about 60 km from Palermo, on the western foothills of the Madonie Mountains. The area is characterized by abundant water springs and is surrounded by the Cervi, Fanusi, and Cozzo di Castellazzo mountains. The origins of Scillato are closely linked to the presence of its water resources, which were historically exploited for the construction of numerous mills. The inhabited center grew around these mills. The first documented reference to a mill in this location dates back to 1156, while the name Scillato (Xillatum) appears in documents from the late 12th century. However, some local historians have speculated that the origins of the village may be even older, possibly linking it to a colony of Athenian Greeks who settled in these hills after the destruction of Troy. Despite its long history, Scillato has maintained its identity as a rural village, without being involved in major historical events. It has been under various lordships, following the fate of Sicily. Until 1961, Scillato was a fraction of Collesano, then gaining administrative autonomy with Regional Law No. 8, effective from April 11 of the same year.
from Comune di Scillato. (2024). Comune di Scillato. https://www.comunescillato.pa.it/

Sclafani Bagni

II.1.4.3 Madonie Imeresi

Metropolitan City	Palermo (PA)
Region	Sicilia
Population	374 abitanti (01/01/2023 - Istat)
Area	134,90 km²
Density	2,77 ab./km²

Seismic and climatic classification

Seismic Zone	2
Climatic Zone	D
Degree Days	1.927

Geographic data

Altitude	755 m a.s.l. - minimum: 118 - maximum: 1.132
Geographical Coordinates	*sexagesimal system* 37° 49' 22,08" N - 13° 51' 20,16" E *decimal system* 37,8228° N - 13,8556° E

History

An Italian municipality located in the metropolitan city of Palermo, Sicily, with a population of 375 inhabitants. It is the least populated municipality in the metropolitan area of Palermo. The adjective "Bagni" was added in 1954 with Regional Law No. 69/53 to highlight the presence of a natural hot spring in the countryside, which in the previous centuries had been the subject of attempts for thermal exploitation. Sclafani Bagni is part of the Madonie Park. The origins of Sclafani have been the subject of unfounded speculations by local scholars, who referred to a passage from Diodorus Siculus. In his account of the clashes that took place around 306 B.C. between Agathocles and Dinocrates, the mountain Gorgium and the center of Ambica are mentioned: the first is identifiable with the mountain above Caltavuturo, while the second would correspond to the inhabited center of Sclafani.

The strategic location of Sclafani in the hinterland of Imera suggests the possibility of an ancient military settlement for controlling the innerpenetration routes, although there is no archaeological evidence to support this hypothesis. The etymology of the name has been linked to a supposed Aesculapius Fanum (temple of Asclepius), while the Arab name has been indicated as 'Isqlafinah or Sqlafiah. The first documented reference to Sclafani dates back to the Cambridge Chronicle of 938, in which an episode related to the struggles between Muslim factions for control of Sicily is mentioned.

After the Norman conquest (1060-1091), Sclafani was assigned to various lords, including Giordano d'Altavilla, Matilda (sister of Giordano), Adelasia (daughter of Giordano), Giovanni di Sclafani, and Goffredo di Montescaglioso. In the first half of the 14th century, the fief was held by Matteo Sclafani, Count of Adernò, known for the construction of Palazzo Sclafani in Palermo in 1330. During this period, the inhabited center expanded, a defensive wall was built, and the castle was modified.

However, the death of Matteo Sclafani without male heirs led to disputes between the Peralta and Moncada families, who competed for the fief. In the 16th and 17th centuries, the county of Sclafani gradually fragmented through the sale of land and properties. Unlike other centers in the Madonie, the population did not increase significantly, primarily due to the foundation of new settlements in the surrounding area. This trend reversed only in the early 20th century.

from Comune di Sclafani Bagni. (2024). Comune di Sclafani Bagni. https://comune.sclafanibagni.pa.it/

Fig. II.1.4.1.4 | Madonie Imeresi. ©Luisa Lombardo, 2021

II.1.5 Enhancement of the rural landscape

Italy and Europe are distinguished by a territorial configuration that expresses a strong rural character (Alison, 2016), marked by the widespread presence of small towns characterized by vernacular architecture and high landscape quality (Ausiello, 1999). Sicily also reflects this characteristic in its vast inner areas, where a significant settlement and cultural heritage has developed, contributing in a meaningful way to the definition of the Italian rural landscape (Barbieri, 1970). This heritage represents not only a historical legacy but also a living element of the territory, where traditional economic activities, local community work, and cultural practices continue to influence the form and use of the landscape.

Sicily's geographical isolation, due to its insular condition, has led to urban development mainly concentrated along the coastal areas, while the inner areas – such as the Madonie region – have maintained a strong rural vocation, testifying to the historical interdependence between local communities and their natural environment. According to the "Factsheet on 2014-2020 Rural Development Program for Sicily" from the European Commission, 97% of Sicily's territory is classified as rural, with 68.5% designated for agriculture and 15% for forestry activities. This prevalence of rural areas emphasizes the importance of sustainable development that takes local peculiarities into account (Bonesio, 2005). The Madonie region, which falls under this classification, is a mountainous territorial system with a dense network of small scattered settlements, 16 out of 21 of which have fewer than 5,000 inhabitants. Its territorial organization is deeply rooted in the mountainous structure and agro-pastoral tradition (Biasutti, 1924), making it an emblematic example of a "distributed" territory characterized by low population density (Albani et al., 2013), wealthy towns, and many isolated assets spread across the land[1].

The historical analysis of the Madonie area highlights how local communities have developed a deep relationship of mutual adaptation with the natural environment, strategically using the available resources and shaping a landscape made up of unique architectural and landscape elements (Coletta, 2005). One of the most characteristic aspects of these areas is the presence of isolated assets scattered across the territory, built in response to agricultural, pastoral, and territorial control needs (Cosenza, 1994). These assets – such as watering troughs, sanctuaries, toll houses, and, in particular, farmhouses and haystacks – not only enrich the rural landscape but also represent its main points of reference (De Nardi, 2013). The **farmhouses** are the heart of this settlement system (Musotto, 1998): they are self-sufficient rural complexes, equipped with structures for housing, animal shelter, and agricultural product processing, which for centuries have played a crucial role in the development of agricultural and pastoral activities, sometimes fortified.

The **haystacks**, on the other hand, represent a characteristic and fun-

[1] Ministero della Cultura. (2023). Tutela e valorizzazione dell'architettura e del paesaggio rurale. Piano Nazionale di Ripresa e Resilienza. Retrieved September 16, 2024, from https://pnrr.cultura.gov.it/misura-2-rigenerazione-di-piccoli-siti-culturali-patrimonio-culturale-religioso-e-rurale/2-2-tutela-e-valorizzazione-dellarchitettura-e-del-paesaggio-rurale/

Fig. II.1.4.1 | Synoptic framework of interventions for rural heritage in the PNRR. ©PNRR, 2021.

ctional rural architecture (*Fig. 1*), primarily used as shelters for animals and shepherds (De Paoli, 2013). These structures, built with dry stone and natural materials, are examples of how local communities have adapted their construction techniques to meet climatic and environmental needs, providing protection from the elements and shelter for pastoral activities. The "mannare," large sheepfolds made of dry stone, are another example of vernacular architecture serving the local economy: designed to meet the needs of the pastoral world, the mannare are organized with enclosures and functional spaces for milking, shearing, and cheese production, demonstrating a deep understanding of pastoral labor dynamics and a careful use of local resources. In addition to residential and pastoral buildings, dry stone is also used for agricultural infrastructure, such as terraces and dry stone walls (Alessandrini, 2001), which over the centuries have contributed to shaping the agricultural landscape of the Madonie.

The "**case cantoniere**," typical of the Sicilian landscape, are functional buildings originally intended for the surveillance and maintenance of communication routes. These structures, often located at the edges of rural roads, serve as an example of how vernacular architecture also responded to the need for territorial control. The sanctuaries, scattered throughout the mountainous and rural areas, represent places of worship with roots in popular spirituality and the cultural identity of local communities. These buildings, constructed with locally available materials, are often set in breathtaking landscapes, symbolizing the connection between the people's religiosity and the surrounding natural environment.

Castles and fortifications, though fewer in number, are testimonies of a Sicily that, over the centuries, experienced periods of domination and conflict. Often located in strategic positions, these defensive buildings are prime examples of how architecture responded to the needs of defense and territorial control. The windmills and watermills, symbols of traditional techniques for exploiting natural resources, were fundamental to the rural economy of Sicily. These structures, with their distinctive design and use of renewable energy sources, are the beating heart of the agricultural and industrial history of the Madonie, employed for grain milling and other productive activities.

Medieval bridges, some of which are still visible in the Madonie region, are significant examples of functional and enduring architecture that connected isolated communities through the network of rural communication routes. Often made of local stone, these structures are not only links between places but also elements that reflect the ingenuity of the communities in adapting to the geography of the land (*Fig. 3*).

In this context, vernacular architecture (Di Pasquale et al., 2016) emerges as one of the most authentic expressions of the bond between humans and the environment. Evolving over the centuries through the use of local materials and techniques, it allows buildings to integrate into the landscape without disrupting its aesthetic and visual balance. This approach not only meets practical and climatic needs but also represents a form of proto-bioarchitecture, utilizing renewable and readily available materials to create sustainable and durable buildings (Ferrara et al., 2003).

Overall, the settlement system of the Madonie is characterized by a delicate balance between urbanized areas and the natural landscape. Many of the small inhabited centers have defensive origins and were built in strategic positions, following the needs of territorial defense and in perfect harmony with the local geomorphological features. The central part of the area has a lower settlement density, while areas closer to the main peaks of the Sicilian Apennines show a higher concentration of inhabited nuclei, highlighting the ability of local communities to integrate with the surrounding environment and develop a flexible and adaptable settlement system based on the land's configuration (La Regina, 1980).

The construction expertise of the Madonie communities (Rudofsky, 1964), as well as of many other inner areas of Sicily (Leone, 2009), is reflected in a

building heritage that not only meets practical and functional needs but also engages deeply and harmoniously with the natural landscape. The use of local materials, such as stone, wood, straw, and brick, was chosen not only for their availability and accessibility but also for their adaptive properties to the specific climatic, geographical, and cultural conditions of each area. These materials have become symbols of an architecture that was able to meet the practical needs of the communities without compromising the aesthetics and integration with the surrounding natural environment (Mercadal, 1984). Thanks to their durability, sustainability, and ability to "breathe," these constructions have had a minimal ecological footprint, contributing to the preservation of the visual, environmental, and historical characteristics of the landscape, while maintaining the aesthetic quality of the territory and local traditions.

This architecture is also the result of a continuous interaction between the functional needs of daily life and the challenges posed by the mountainous terrain of the Madonie (Pagano, 1935). The local communities, with great adaptability and ingenuity, were able to optimize the use of available resources, developing a construction system that not only responded to the needs for defense, housing, and work but was also capable of withstanding the changing environmental conditions and the difficulties arising from a rugged and wild territory. The materials used, such as local stone, were often

Fig. II.1.4.2 | Rural landscape ©Quelli del Parco delle Madonie, 2023.

employed with traditional techniques that made the most of their physical properties. At the same time, the shapes and architectural typologies adapted to the geography of the places, from farmhouses to roadside houses, shelters, windmills, and watermills, to medieval bridges, creating a network of buildings that, although diversified in their functions, were perfectly integrated with the natural landscape (Ragni, 2011).

In the Madonie Park, pastoral tradition and agricultural economy have played a decisive role in the development of building techniques, creating a heritage that reflects both human ingenuity and adaptation to natural conditions. This building heritage constitutes an extraordinary resource for the sustainable development of the territory and for the enhancement of the cultural landscape that characterizes the region. The rehabilitation of ancient construction techniques, in an innovative and sustainable way, could not only give a new boost to the local economy but also contribute to strengthening social cohesion, improving the quality of life for the communities living in these inner areas (Valussi, 1968).

This integrated approach sees rural architecture as a foundational element of a cultural landscape that is both the historical memory of a territory and a key component for its future sustainability. The National Rehabilitationand Resilience Plan (PNRR) has paid particular attention to the enhancement of rural architecture, recognizing the importance of preserving the entire rural landscape, from villages to isolated buildings, which have often been neglected in favor of interventions focused on historical centers. The PNRR's objective is not only to recover the building heritage but also to overcome territorial inequalities, promoting a development model that combines landscape conservation with economic growth, as well as promoting a widespread system throughout the Mediterranean basin (Riberio, 1972).

The main challenges of the intervention are multiple and concern both the conservation of distinctive elements of historical rural landscapes, with particular attention to the distribution of buildings, and the rehabilitation of buildings that have suffered from degradation, abandonment, or alterations over time. In particular, the Madonie Park, with its network of isolated buildings, requires special attention to prevent these vernacular architectural testimonies from being lost. The challenges include promoting job opportunities in the agricultural, construction, and tourism sectors, strengthening rural economies and mitigating the effects of the social and economic crisis exacerbated by the pandemic.

Another fundamental objective of the intervention is the creation of an integrated system that supports the tourist and cultural enhancement of the territory. The PNRR (*Fig. 2*) allocates a total investment of 600 million euros to Italy, with 590 million earmarked for the rehabilitation of agricultural settlements and historical rural buildings, and 10 million for the census and creation of information systems. These interventions aim to enhance not only the most visible and well-known structures but also the more isolated ones. This type of intervention has been supported upon the presentation of a project by private individuals that guaranteed not only the rehabilitation of the structure but also the possibility of expanding the tourist offer by including not only commercial activities but also the use of renewable energy sources and sustainable transport systems to explore and enhance the territory. The municipalities of the Madonie Park, including Polizzi Generosa[2], Isnello, Gratteri, and San Mauro Castelverde, have also been included in the PNRR Call – Line B, with concrete interventions involving both building rehabilitation and the enhancement of intangible cultural heritage, such as festivals, exhibitions, and cultural activities that strengthen the bond with the local community.

The projects have not only stimulated the local economy but have also created important new job opportunities, improving the quality of the landscape and contributing to a broader process of inclusivity, promoting tourism that respects and enhances local culture. The intervention focused

[2] Madonie Live. (2022, 24 giugno). Polizzi Generosa in graduatoria nell'attrattività dei borghi previsto dal PNRR. Madonie Live. https://madonielive.com/2022/06/24/polizzi-generosa-in-graduatoria-nell-attrattivita-dei-borghi-previsto-dal-pnrr/

on the redevelopment of public and private buildings, particularly those that were abandoned or in a state of decay, with the aim of returning to the community a building heritage that had long been inaccessible (Sabatino, 2013).

Overall, the rehabilitation and enhancement of the rural heritage of the Madonie has represented a unique opportunity to rethink the future of the territory, promoting a development model that respects the environment, culture, and traditions, while also creating sustainable economic opportunities for future generations. However, four municipalities are not sufficient for the rebirth of the territories. The synergy between the rehabilitation of rural architecture and the promotion of the landscape as a cultural and economic resource will be essential for building a future vision that respects traditions but is open to the innovations necessary for the well-being of local communities and the revitalization of the entire territory.

Below, an exhaustive analysis of the municipalities in the Madonie area will be presented, examining each municipality individually to understand the similarities, differences, and territorial peculiarities. This detailed study will highlight the specific characteristics of each locality, not only in terms of architectural and landscape heritage but also with respect to socio-economic dynamics, local traditions, and development potential. Through this analysis, targeted enhancement strategies can be formulated, considering the unique features of each municipality, strengthening the link between rural heritage and sustainable growth opportunities for the entire Madonie territory.

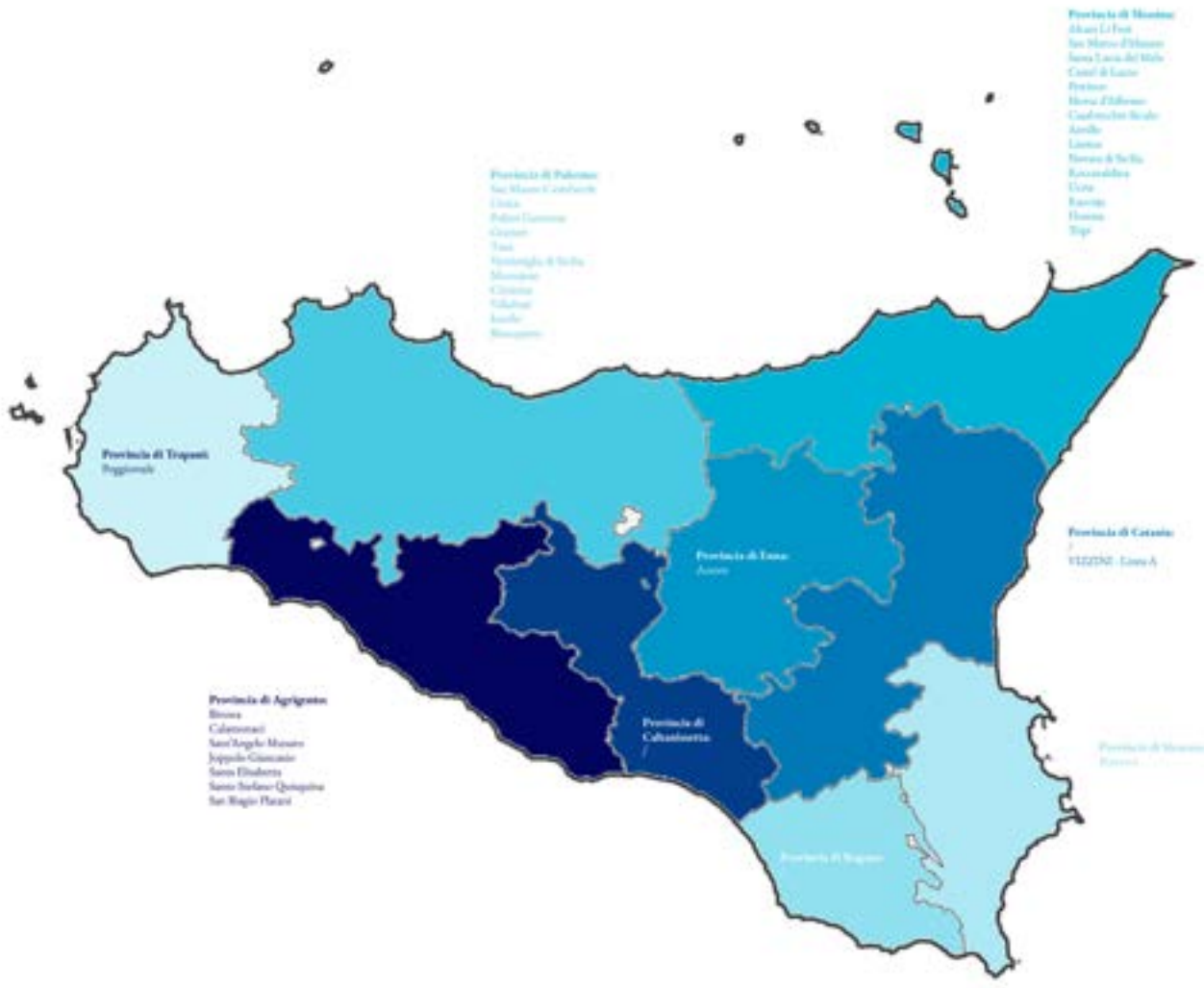


Fig. II.1.4.3 | Winning towns of the Borghi Call for Proposals ©Luisa Lombardo, 2024.

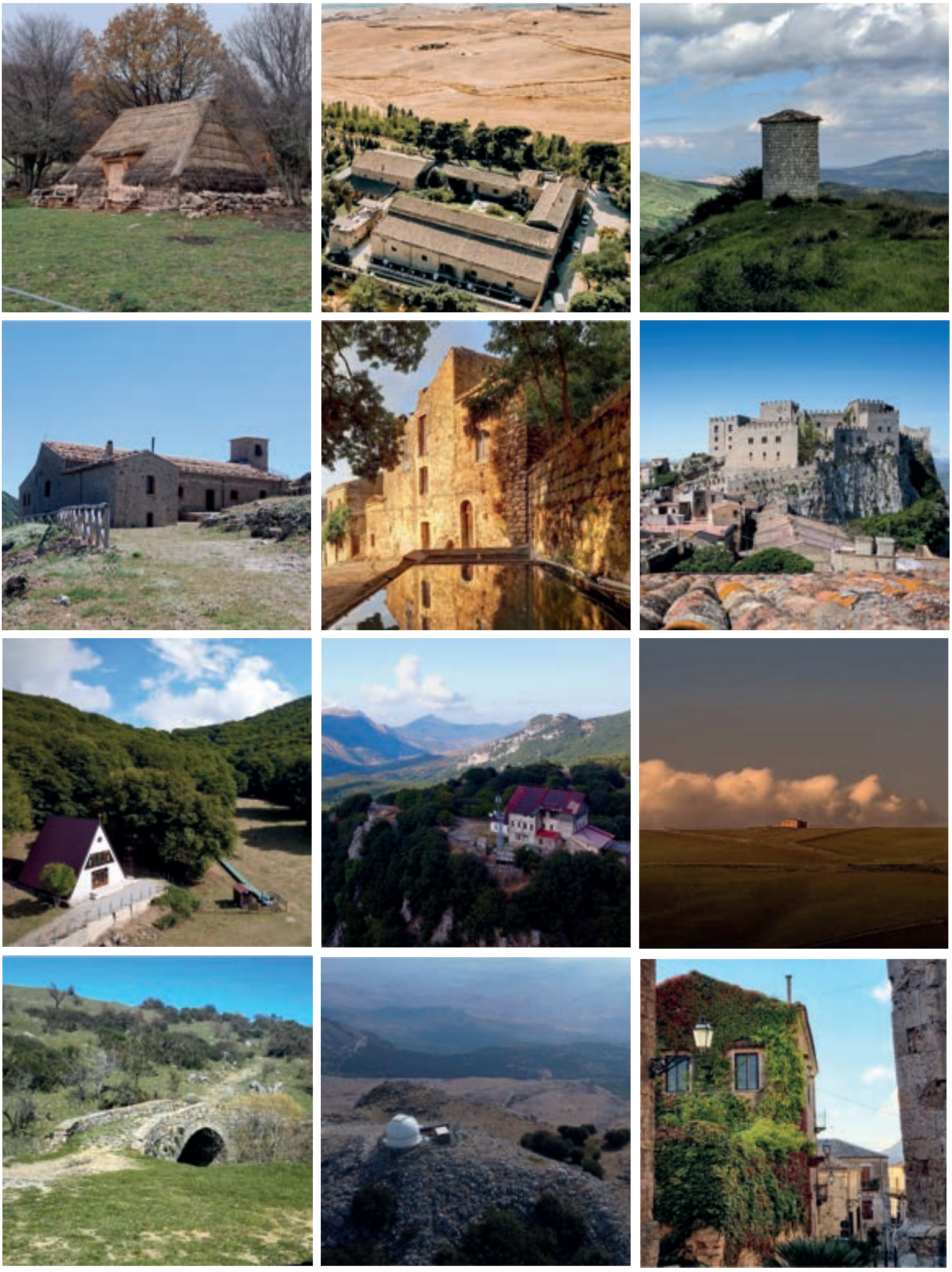


Fig. II.1.4.4 | Isolated assets and rural architecture of the Madonie ©Luisa Lombardo, 2024.

II.2 SWOT analysis of the Madonie area

The analysis of a territory and its inner dynamics requires the use of a combination of qualitative and quantitative methods, offering different perspectives to fully understand the characteristics, issues, and opportunities of an area. Quantitative methods focus on the collection and analysis of numerical data, aiming to measure and describe phenomena objectively. These methods provide precise and replicable statistical information, essential for making evidence-based decisions. Such information is useful for mapping the demographic structure, identifying the population's needs, and understanding untapped potential.

Surveys and structured questionnaires, on the other hand, are tools used to gather data on the opinions, behaviors, and preferences of the population. Closed-ended questions allow for the collection of numerical data that is easily analyzable and comparable. Finally, socio-economic indicators such as unemployment rates, average income, access to public services, and transportation efficiency provide an objective assessment of the population's well-being and territorial inequalities; these can be consulted through the database provided by ISTAT.

Conversely, qualitative methods focus on understanding experiences, perceptions, and social dynamics, collecting non-numerical data that offers a deeper and more subjective view of the territory. Semi-structured or unstructured individual interviews allow for the exploration of residents' opinions, personal experiences, values, and perceptions in detail. These methods provide in-depth information that cannot be easily measured with numbers. Focus groups, which involve facilitated group discussions, allow for the collection of collective opinions on specific topics, encouraging dialogue between different perspectives and enhancing the understanding of issues and opportunities.

Participant observation is another qualitative method that involves directly observing the dynamics of a community, interacting with residents, and understanding their habits, behaviors, and daily interactions. This approach helps to capture the social and cultural relationships that characterize a territory. Oral histories and stories are another useful tool for documenting lived experiences and understanding how people perceive their environment, changes over time, and the challenges they face.

The integration of qualitative and quantitative methods enables a more comprehensive understanding of the territory. A mixed approach, as in this case, allows for triangulating data, for example, by combining the results of a survey with responses and stories gathered through interviews, creating a more nuanced view of territorial and social dynamics. This is what has been done in the territories in order to have a comprehensive understanding of the dynamics undertaken and present in the Madonie Park and its 21 municipalities.

The SWOT analysis has been favored because it responds to the need for rationalizing decision-making processes, which is why it has been taken as a reference point in this thesis to address the issues related to the smaller centers of the Madonie Park Area.

Developed over 50 years ago as a support for defining business strategies

in contexts characterized by uncertainty and strong competition, since the 1980s, it has been used for public intervention choices and to analyze alternative development scenarios. Today, this technique has been extended to territorial diagnoses and the evaluation of regional programs, including community regulations, which now also require its use for the evaluation of plans and programs; it is most commonly used in urban planning but remains an effective method for understanding territorial dynamics.

It is conducted on the *strengths*[1], *weaknesses*, *opportunities*, and *threats* (SWOT) of a specific territorial context; the first two are inherent to the analysis context and can be modified through policy or proposed intervention. Opportunities and threats, on the other hand, arise from the external context and cannot be modified.

A reasoned analysis of the territorial context in which an intervention program is implemented helps define development opportunities for a sector or area of intervention. It highlights the main factors, both inner and external to the analysis context, that can influence the success of a program/plan; in particular, it allows for the analysis of alternative development scenarios, supports the establishment of a strategy consistent with the context being addressed, and helps identify the main strategic guidelines in relation to an overall economic or sectoral development goal.

Its use is recommended, especially during the ex-ante phase, to improve the integration of the program into its context; during the intermediate phase, it helps verify if the actions identified are still relevant given the changes in the context and provides a tool for deciding on modifications to the program. Ex post, it serves to contextualize the final results of the plans and programs.

The methods through which it can be carried out are multiple, and each of them is useful for territorial analysis:

- **desk-based** (also called *desktop*): the strengths, weaknesses, opportunities, and threats are determined by the researcher based on contextual data, and the scenario forecast is based on "expert knowledge" that is neutral and objective;
- **group work** (defined as "participatory"): the strengths, weaknesses, opportunities, and threats are identified using participatory techniques, and the forecast of shared scenarios is based on joint analysis between experts and *stakeholders* of the contextual data.

The analysis collects in a matrix the critical elements of an intervention and the territory in which it is carried out; this matrix is then organized into four sections that gather the characteristics identified as strengths, weaknesses, opportunities, and threats, and refers to:

- the territory subject to intervention;
- the sector concerned and/or individual sectors;
- the priority areas in which a program is structured.

It is carried out in six phases: in the first phase, the territorial context in which the program is implemented is surveyed (construction of socio-demographic and economic indicators) and the main trends and issues are identified; in the second phase, the possible actions are identified in relation to the main issues highlighted.

In the third phase, the analysis of the external context and the identification of opportunities and threats are carried out; finally, in the fourth phase, the analysis of the program context and the identification of factors, even if partially under the control of the program manager, that can facilitate or hinder the development of the area are made.

The fifth phase deals with the classification/selection of possible actions based on their relevance, i.e., identifying those actions (strategic guidelines) that, leveraging strengths, trying to reduce weaknesses, maximizing opportunities, and minimizing threats, are more capable of reducing development problems. In the last and sixth phase, it is used to assess the relevance of a strategy already implemented or planned (specifically, it involves verifying the relevance of interventions with respect to contextual elements).

[1] Specifically, the strengths are the positive aspects of the organization or project that can be leveraged to achieve the goals, while the weaknesses are the negative aspects of the organization or project that may hinder the achievement of the goals. Opportunities are favorable events or trends that can be exploited to achieve the objectives, while threats are unfavorable events or trends that may hinder the achievement of the goals.

THEMES OF SWOT ANALYSIS

ROADS INFRASTRUCTURE

Roads
Total length of the road network (km)
Type of roads (state, provincial, municipal)
Condition of the roadway
Presence of bike lanes and pedestrian paths

Public transport
Availability of bus, train, and tram services
Frequency and schedule of routes
Ticket prices

ACCOMMODATION FACILITIES

Number of hotels, agritourisms, B&Bs, holiday homes
Accommodation capacity (number of beds)
Average occupancy rates
Type of clientele (Italian, foreign)

DEMOGRAPHIC ASPECTS

Resident population (total, males, females)
Average age of the population
Birth and death rates
Migration balance (immigrants and emigrants)
Number of foreign residents

LIFESTYLES

Average income per capita
Employment rate
Level of education
Average consumption expenditure
Access to the internet and digital services

ECONOMIC ASPECTS

Presence of economic activities (agriculture, industry, tourism)
Number of businesses and employees
GDP per capita
Unemployment rate
Leading economic sectors

CULTURE AND TRADITIONS

Number of museums, libraries, archaeological sites
Cultural and traditional events
Cultural and volunteer associations
Presence of intangible heritage (UNESCO)

TECHNOLOGY

Internet and broadband coverage
Use of smartphones and computers
E-government (online public administration services)
Presence of ICT companies

LANGUAGE

Mother tongue of the population
Prevalence of the Sicilian dialect
Knowledge of foreign languages

SECURITY

Crime rates (crimes against persons and property)
Presence of law enforcement agencies
Perception of safety by citizens

LANDSCAPE

Territorial area (km^2)
Altitude
Type of landscape (mountain, hill, plain)
Presence of protected areas

TERRITORY

Land use (agricultural, forestry, urban)
Water resources
Hydrogeological risk
Air quality

LOGISTIC

Distance
Altitude

CONSTRUCTION

Occupied properties
Abandoned properties

Fig. II.2.1 | Breakdown of the SWOT Analysis. ©Luisa Lombardo, 2022.

The **advantages** of the SWOT analysis are that the in-depth analysis of the context helps in defining strategies; the verification of the alignment between strategy and needs helps improve effectiveness; it allows for consensus on strategies (if all parties involved in the intervention participate in the analysis); and its flexibility.
The **disadvantages**, on the other hand, include the risk of subjective procedures by the evaluation team in selecting actions; it can describe reality in an overly simplistic way, and if not carried out in a partnership context, there is the risk of a disconnect between the scientific plan and the pragmatic political one.

At the local level, and therefore for the Madonie Park area, for the SWOT analysis, not only the municipalities identified by the National Strategy for Inner Areas (SNAI) (*Fig. 1*) were considered, but also the municipalities that, according to the same strategy, are identified as strategic gravitational areas for the SNAI Area, specifically the following municipalities: Alimena, Blufi, Bompietro, Castellana Sicula, Gangi, Geraci Siculo, Petralia Soprana, Petralia Sottana, Polizzi Generosa, Castelbuono, Collesano, Gratteri, Isnello, Pollina, San Mauro Castelverde, Aliminusa, Caccamo, Caltavuturo, Scillato, Sclafani Bagni, as well as 10 other surrounding municipalities, including Montemaggiore Belsito, Scillato, Sclafani Bagni, Termini Imerese, Sciara, Cerda, Campofelice di Roccella, Lascari, Cefalù, and Valledolmo.

II.2.1 Examination of demographic, economic, social, cultural, geographical, and environmental data

For the area under study (i.e., the Madonie Park), the comprehensive analysis of the territorial characteristics was organized according to the following framework provided in *Fig. 1*. Each thematic area was examined by analyzing data related to the individual municipalities and the average data from ISTAT sources. Below is the in-depth analysis of each thematic area

ROAD NETWORK - ROAD INFRASTRUCTURES

For a comprehensive analysis of the road network in the Madonie area, several key elements must be considered, such as road infrastructure, road types, pavement conditions, cycling paths, vehicular traffic, and public transportation. Examining the road infrastructure is crucial for understanding the accessibility and connectivity between the various municipalities and rural areas of the region. The types of roads, including main, secondary, and rural roads, provide *insights* into the network's capacity to support traffic flow and effectively link local communities.

Pavement conditions are a critical factor for safety and circulation quality. Poorly maintained roads can not only increase the risk of accidents but also reduce the average speed of transportation, negatively impacting mobility and the local economy. Cycling paths, if present, are an indicator of the sustainability of the road network and the attention given to the needs of cyclists and those who prefer sustainable mobility. The presence and quality of these infrastructures can encourage bicycle use, reducing vehicular traffic and contributing to improved air quality.

Vehicular traffic directly affects the quality of life for residents, particularly in more urbanized areas. Effective traffic management can reduce travel times and emissions, while congested traffic can have the opposite effect. Finally, public transportation plays a crucial role in local mobility. Evaluating the efficiency of public transport, considering schedules and ticket prices, such as those for routes between the reference town and Palermo, is essential to understand how accessible and usable the service is for the population. A well-organized, affordable public transport system can reduce dependence on private cars, enhancing the inclusivity and sustainability of the road network.

Analyzing these factors helps to understand the challenges and opportunities related to the road network in the Madonie, providing a solid foundation for developing strategies that improve mobility, safety, and quality of

life in the area. Based on these premises, the SWOT analysis of the Madonie context was conducted by starting from a much broader context, specifically by relating it to the national context, that is, Italy, initially focusing on the area's transport connections in relation to the broader Italian context. In particular, the following transport systems will be analyzed: maritime, air, rail, and road transport, both private and public.

The Port of Termini Imerese is also an important connection point between Sicily and the rest of Italy, a hub for maritime traffic, both for cargo and passenger transport. Today, it is also an important tourist center, thanks to its strategic location, which is central to the island and relatively close to the main ports and airports on the island, such as Palermo, Catania, and Trapani. This makes it less distant from essential services and enables interaction with the rest of the island. Regarding maritime transport, it is connected to the rest of Italy through a series of services, including:

- **air:** Palermo Airport, located about 30 km from the port of the same city, is served by a range of airlines connecting Sicily to major Italian and international cities. However, it takes between 50 minutes to an hour and a half to reach the airport;
- **train:** the Termini Imerese railway station is served by a number of trains connecting the city with some of Sicily's major cities. Some stops, such as Cefalù, Lascari, and Montemaggiore Belsito, lead to the Madonie area;
- **bus:** the port is served by several bus lines that connect the city with major Sicilian cities, although these run at specific times and are not frequent throughout the day;
- **car:** the port is connected to the Italian motorway network via the A19 Palermo-Catania; all other towns are connected by SS (state roads) and SP (provincial roads);
- **ferries:** the port is connected to several Italian cities, including Palermo, Catania, Naples, Genoa, Livorno, Civitavecchia, and Savona;
- **cruises:** the port is an important stop for cruises, which depart from and arrive at various Italian and international destinations, although the main port remains Palermo.

Further analyses focused on the travel distances of the municipalities within the district in relation to the provincial and regional capitals. The travel distance ranges from 30 minutes to a maximum of 2 hours, as shown in *Fig. 2*. Over the years, this distance has suggested a division of the Madonie area into Ultraperipheral, Peripheral, and Intermediate Areas.

The analysis reveals that, despite the centers of the Madonie being mainly composed of peripheral locations, they are still served by nearby centers connected to the rest of Italy, primarily referring to Palermo or Enna. It is also true that the region has limited motorway infrastructure, except for the main route represented by the A19. However, by using alternative means of transportation, such as buses or private vehicles, it is possible to reach the strategic hubs of various connections with surrounding cities and regional airports, albeit with some limitations. Now, a detailed analysis of the connections between the involved municipalities will be presented.

ROADS

Length of the road network

The average length of the road network in the Sicilian municipalities under study is approximately 47 km. Among the municipalities analyzed, Termini Imerese (112.8 km), Collesano (78.5 km), and Castelbuono (64.2 km) stand out for their size, while smaller municipalities such as Sciara (27.3 km), Campofelice di Roccella (32.9 km), and Lascari (25.4 km) are closer to the provincial capital.

A significant correlation can be observed between the length of the road network and the population size of the municipality: larger populated areas tend to have more extensive road networks. When compared with natio-

nal data, the average length of the road network in Italian municipalities is about 55 km. In general, the road network in the Madonie municipalities appears slightly less extensive than that of Italian municipalities overall.

The length of the road network is a crucial indicator for evaluating mobility and accessibility in a municipality. Generally, this data highlights the inaccessibility of smaller, more peripheral municipalities.

This parameter varies depending on several factors, including population size, territorial extension, orographic features, and the presence of economic activities. Data on road network length are useful in the planning of targeted interventions for maintenance and infrastructure development, thus helping to improve the efficiency of the road system and the overall quality of urban mobility between municipalities.

Type of road infrastructure **(state, provincial, and municipal roads)**
The road network in the Sicilian municipalities under study is primarily composed of state roads (SS) and provincial roads (SP). The presence of highways is limited to specific municipalities, including Termini Imerese and Cefalù on the A19.

Most of the populated centers have a well-structured municipal road network, ensuring adequate connectivity to the main urban and rural areas.

When compared with national data, a similar distribution between state, provincial, and municipal roads is observed in the Sicilian municipalities compared to the rest of Italy. However, it is important to note that the highway network in Sicily is much less extensive than in other regions of northern Italy.

This scenario reflects a specific infrastructural characteristic of the Sicilian region, highlighting the predominance of state and provincial roads in the local road network. The limited presence of highways, which can be found only in certain locations, affects regional mobility and connectivity, aspects that require attention when evaluating infrastructure requirements and planning potential targeted interventions.

It is not surprising that the municipalities of the Madonie are often difficult to access, and as presented in Chapter I, the greatest investment from small municipalities in the framework of the SNAI interventions and the PNRR relates to improving these infrastructures.

The condition of marginality is due, not only to decentralization from the main urban centers, but also to an impractical road surface that limits possible movements within the area.

Road surface conditions
The condition of the road surface in the Sicilian municipalities under analysis is generally fair, characterized by some areas in good condition and others affected by potholes and depressions. This variability in road surface conditions can be attributed to several factors, including the lack of maintenance interventions, adverse weather conditions, sometimes marked by snow, and the impact of heavy vehicular traffic.

It is evident that municipalities with better road surface conditions are those that have recently carried out maintenance work and received funding from recent grants available to small municipalities, such as the PNRR.

When compared with national data, Sicily shows a similar situation to the rest of Italy, with widespread potholes and depressions on various roads. Northern Italy regions stand out for having a road network in better condition, benefiting from greater attention to maintenance and more substantial investments. This comparison highlights the need to implement targeted strategies for improving road surface conditions in Sicily and the Madonie, in order to ensure greater safety and efficiency in vehicular circulation. Prioritizing maintenance interventions, along with careful monitoring of road conditions, could help mitigate the negative effects of the current variability and promote a more sustainable road environment.

Bicycle paths

The existing bicycle paths in the area are currently limited to only two municipalities, Termini Imerese and Cefalù, with a total length of about 7 km.

At the same time, there is a commitment to promoting sustainable mobility with the planning or creation of new bicycle paths in four municipalities: Castelbuono, Gangi, Petralia Sottana, and Polizzi Generosa, along with one already established by Geraci Siculo[1] in 2022.

The majority of municipalities (24 out of 27) currently do not have bicycle paths, highlighting a significant gap despite occasional sightings of cyclists. Many, in fact, use the state road for physical activity.

This gap prevents the safe and comfortable use of bicycles for transportation, limiting sustainable mobility options.

The creation of new bicycle paths represents a crucial step in promoting sustainable mobility and fostering the development of cycling tourism in Sicily. However, it is essential that related projects are carefully planned and implemented to ensure the safety of cyclists and promote effective use of these infrastructures. Such an initiative could significantly improve the quality of urban mobility and encourage a healthier, more sustainable lifestyle. Moreover, implementing bicycle paths is challenging due to the existing altitudes, which do not facilitate smooth routes. Narrow roads also do not always provide a welcoming environment for new paths.

Vehicle traffic

The National Institute of Statistics (ISTAT) annually publishes a detailed report on road accidents in Italy, providing disaggregated data by region, province, and municipality. Analyzing the report "Road Accidents in Sicily," the following data emerge:

- number of accidents: The municipality with the highest number of accidents is Termini Imerese, with 144 accidents, followed by Cefalù with 84 and Caccamo with 67. At the same time, Alimena, Blufi, Bompietro, and Sclafani Bagni have the lowest number of accidents, with 2 each;
- numero di feriti: Termini Imerese has the highest number of injuries, with 187 cases, followed by Cefalù with 105 and Caccamo with 84. Alimena, Blufi, Bompietro, and Sclafani Bagni have the lowest number of injuries, with 2 cases each;
- numero di morti: Five municipalities (Alimena, Blufi, Bompietro, Castellana Sicula, and Sclafani Bagni) reported no fatalities from road accidents in 2022. Termini Imerese ranks highest with 5 fatalities, followed by Caccamo with 3, and Cefalù, Gangi, and Petralia Sottana, each with 2 fatalities.

This is evident from the lack of fast-flowing roads in the area and the difficulty of traveling through the centers of small municipalities.

PUBLIC TRANSPORT

Presence of Buses, Trains, and Trams

The coverage of bus services appears widespread, with all the municipalities listed benefiting from them. In contrast, the railway network is more limited, serving only a few municipalities through train stations located near the coast. It is noteworthy that none of the municipalities considered have tram connections.

- Inner areas: Mountainous and inner areas are primarily served only by buses, with a potential reduction in the frequency of services compared to coastal areas. The few lines available offer only one or two departures per day to the provincial capital and other nearby cities;
- Coastal areas: Coastal municipalities generally enjoy both bus and train services, with a frequency of connections that tends to be higher than in inner areas. Among these, Cefalù is mentioned as a popular seaside destination, with frequent services throughout the week, and even more during the summer period.

The spread of public transport services is of crucial importance for the mobility of citizens and the economic development of rural areas. The evident

[1] Geraci Siculo is enriched with a mountain bike trail, located in the Fegotti district in the Madonie Park, thanks to a memorandum of understanding between the Municipality and the Regional Department of Rural Development of the Agriculture Department. The initiative, operational since June 2022, aims to promote experiential and sports tourism, encourage territorial regeneration, and counter depopulation. The works include the improvement of the trail and the installation of dedicated signage. Mayor Luigi Iuppa emphasizes the importance of offering attractions that can enhance small villages, allowing visitors to enjoy the unspoiled beauty of the Madonie (Balarm, May 4, 2022).

National connections

Data sources:
Istat - Demographic and territorial balance 2023
Openstreetmap
AST (Sicilian Transport Company)
State Railways

Ports and Airports

SNAI - The Madonie area in Sicily

Classification of areas by distance from the capital

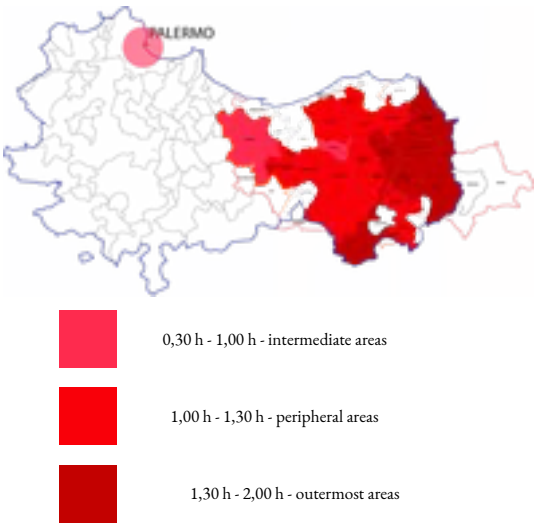


Fig. II.2.2 | SWOT Analysis - National Connections ©Luisa Lombardo, 2022.

Road conditions or road infrastructure

Data sources:
Istat - Demographic and territorial balance 2023
Openstreetmap
AST (Sicilian Transport Company)
State Railways

Roads

LENGTH OF THE ROAD NETWORK	≅47 Km
TYPES OF ROADS	SS e SP
ROAD SURFACE CONDITIONS	Fair/Bad
PRESENCE OF CYCLE OR PEDESTRIAN LANES	3/27
VEHICULAR TRAFFIC	+ Termini Imerese - Sclafani Bagni

Public transports

BUS, TRAIN AND TRAM	
FREQUENCY AND TIMES OF TRIPS	+ Larger municipalities and in high season
COST OF TICKETS	€ 2,00 - 15,00

Fig. II.2.3 | SWOT Analysis - Roads and Road Infrastructure ©Luisa Lombardo, 2023.

accessibility gap between inner and coastal areas presents a challenge that needs to be addressed to ensure equal opportunities for all citizens.

The public transport situation in Sicily has positive aspects, with the widespread presence of buses ensuring a certain level of accessibility. However, the limited railway network and insufficient frequency of services in some areas represent challenges that restrict territorial accessibility. To overcome these challenges, targeted investments and strategic planning are necessary to improve mobility and the quality of life across the entire Sicilian region.

Frequency and timetables of public transport services

The frequency of public transport services varies depending on the municipality and the time of year.

In general, it is observed that services are more frequent in larger urban centers and during the high season, particularly in July and August.

In smaller municipalities, however, the frequency of services may be limited to a few trips per day. Sometimes, there may be just one trip per day or only two scheduled times, leaving gaps during the most useful times, such as the early morning hours for commuting to work or school, or simply for returning home. This disparity in the availability of public transport services reflects the dynamics of demand and supply, influenced by the size of the community and the seasonality of activities.

Ticket costs

The cost of tickets for public transport varies based on the mode of transport used, the distance traveled, and the transport company selected.

- bus: Tickets for buses from Palermo to the listed municipalities range in price from approximately €2.50 to €10.00. The fare is generally calculated based on the distance traveled, with options for single, daily, or weekly tickets. Some bus companies offer discounts for specific user categories, including students, seniors, and people with disabilities.
- train: For trains from Palermo to only some of the coastal municipalities listed, ticket costs range from approximately €4.00 to €15.00. The fare is usually determined by the distance traveled and the type of train used. Various purchasing options are available, including single, round-trip tickets, and monthly or annual subscriptions. Trenitalia also offers fare discounts for students, seniors, and people with disabilities.

Overall, ticket costs for public transport from Palermo to the listed municipalities range from approximately €2.00 to €10.00.

This variation is partly determined by the geographical distance to the destination municipalities, with higher fares generally applied for those located farther away and accessible only by train service. The overall prices are in line with those in other Italian regions.

In the municipalities of the inner areas, there is a tendency for ticket prices to be higher, mainly due to the greater distance from Palermo and the lower frequency of connections. Municipalities along the coastal areas generally have lower ticket costs, attributable to their closer proximity to Palermo and more frequent connections.

Accommodation facilities

While it is important to understand how these small municipalities connect with larger transport hubs, it is equally important to assess the stage of their hospitality sector, or how well the municipalities are able to tap into tourism despite the connectivity challenges identified in the previous analysis.

Specifically, in this section, we will analyze the number of accommodation facilities present, the resulting occupancy rates, as well as the types of clientele.

Number of accommodation facilities in Sicily

The increase in the number of hotels, agritourisms, bed and breakfasts, and

vacation homes in Sicilian municipalities reflects a steady rise in tourism in the region. However, it is important to note that their distribution is not uniform, with a higher concentration in coastal areas, such as Cefalù for the Madonie area, and in art cities or, more specifically, in areas where artistic itineraries and cultural activities are on the rise or strongly present.

Overall, the most common types of accommodation include some hotels, many bed and breakfasts, and numerous vacation homes. Coastal areas exhibit the highest concentration of accommodation facilities, particularly hotels and vacation homes. This phenomenon can be attributed to the presence of beaches, the sea, and scenic landscapes—factors that attract many visitors during the summer. Additionally, the ease of access and the architectural component, along with the preservation of traditional architecture, are key factors. The so-called "jewel villages," such as Cefalù or Castelbuono, attract many visitors annually due to their cultural and historical-architectural peculiarities.

In contrast to the coastal areas, the inner areas show a lower density of accommodation facilities, and many second homes are being converted or are in the process of being transformed into vacation homes. This is the era of slow tourism, where visitors seek to immerse themselves in the habits of small towns, savoring local smells, tastes, and activities, as well as ways of life. However, rural tourism is developing, offering guests the opportunity to immerse themselves in nature and local traditions, contributing to the diversification of the tourism offer. Art cities, such as Cefalù, offer a wide range of accommodations, especially hotels, bed and breakfasts, and vacation homes. This phenomenon is linked to the presence of monuments, museums, and other sites of historical and cultural interest, which attract a continuous flow of tourists.

Accommodation facilities

Data sources:
Istat
Ministry of Tourism

NUMBER OF HOTELS, FARMHOUSES, BED AND BREAKFASTS, HOLIDAY HOMES	**+ Coastal areas** **- Inner areas**
ACCOMMODATION CAPACITY (NUMBER OF BEDS)	**+ Coastal areas** **- Inner areas**
AVERAGE EMPLOYMENT RATES	**+ Coastal areas - 60%** **- Inner areas - 20%**
TYPE OF CUSTOMER (ITALIAN, FOREIGN)	**Coastal areas - Foreigner** **Inner areas - Italians**

Fig. II.2.4 - SWOT Analysis - Accommodation Facilities ©Luisa Lombardo, 2023.

[2] Scent of Sicily. (2023). Cefalù: Guida turistica Sicilia. Retrieved August 9, 2024, from https://www.scent-of-sicily.it/guida-turistica-sicilia/cefalu/

[3] PalermoToday. (2024). La Montanina, il rifugio tra i boschi delle Madonie recuperato da Legambiente. Retrieved August 9, 2024, from https://www.palermotoday.it/cronaca/la-montanina-rifugio-orestano-piano-zucchi-legambiente.html

Accommodation capacity

The increase in accommodation capacity in Sicilian municipalities reflects a steady growth in tourism in the region.

It is important to note that the distribution of available beds is not uniform, with a higher concentration in coastal areas. In general, the types of accommodation with the highest capacity include hotels (sparsely present in mountainous areas, and once old mountain refuges), bed and breakfasts, and vacation homes.

Coastal areas thus show the highest accommodation capacity, particularly in terms of hotels and vacation homes. This phenomenon can be attributed to the presence of beaches, the sea, and scenic landscapes, which attract a considerable flow of tourists.

In contrast, inner areas have lower accommodation capacity. However, rural tourism is developing, offering visitors the opportunity to experience nature and local traditions, contributing to the diversification of the tourism offer.

Cefalù[2,3] offers a wide range of accommodation, particularly vacation homes, large hotels such as Costa Verde and Relais, and bed and breakfasts. This wealth of options is due to the presence of monuments, museums, and other sites of historical and cultural interest, which are strong attractions for visitors, as well as festivals and nightlife activities for both young and older people.

Average occupancy rates

Data on the occupancy rates of accommodation facilities in Sicilian municipalities show significant variability, with values ranging from 20% to 60%. In general, higher occupancy rates are observed in coastal areas, such as Termini Imerese and Cefalù, which benefit from strong tourist appeal.

In inner areas, occupancy rates tend to be lower, with some exceptions like Gangi and Castelbuono, which have been able to effectively enhance their tourist resources. The data also highlight a marked seasonality in tourism, with occupancy rates significantly increasing during the high season and dropping during the low season.

In coastal municipalities such as Cefalù and Pollina, the highest occupancy rates are observed, thanks to the presence of beaches, the sea, and scenic landscapes, as well as tourist resorts and a strong focus on nightlife. The seasonality of tourism is particularly pronounced in these areas, with peaks in occupancy during the summer and a decrease, though smaller, during the winter months.

In inner municipalities such as Alimena and Bompietro, occupancy rates are generally lower, sometimes even scarce. However, rural tourism is developing, offering visitors the opportunity to immerse themselves in nature and local traditions. The de-seasonalization of tourism emerges as a significant challenge for these areas.

Clientele type **(italian, foreign)**

Data on the type of clientele in accommodation facilities in Sicilian municipalities reveal a clear predominance of Italian tourists, with some exceptions like Cefalù and Pollina, which attract a significant influx of foreign visitors, particularly French, German, and British.

In coastal areas, foreign clientele is more prevalent, especially during the high season. In contrast, in inner areas, the Italian clientele is more consistent, with a predominant presence of families and individuals seeking a quiet type of tourism, in close contact with nature.

DEMOGRAPHIC ASPECTS

The latest ISTAT data on depopulation in small towns is alarming for the Madonie area. There has been a significant population decline, starting even before the pandemic season, although there was a slight increase due to the possibility of working remotely, away from the chaos and human contact.

In the following paragraphs, we will outline the current population presence, its average age, and the migration flow to understand the territorial dynamics that can help determine the possible strategies for the development of *Smart Villages*.

Resident population (total, males, females)
The resident population in Sicilian municipalities shows a declining trend, although some exceptions, such as Campofelice di Roccella and Cefalù, key centers of summer tourism due to the high number of holiday facilities, show a demographic increase.

This decline is more pronounced in inner areas, although sometimes there is a consistent return to the hometown during the summer period and for local events that animate the territory. Coastal areas tend to be more densely populated. The gender gap in the population is minimal.

Average age of the population
The average age of the population in Sicilian municipalities exceeds the national average, standing at 45.4 years. The inner areas have a higher average age, while coastal areas have a generally younger population. The age gap between municipalities is significant.

Birth and mortality rates
Birth rates in Sicilian municipalities are lower than the national average, which is set at 6.8 births per 1,000 inhabitants. In contrast, mortality rates are higher than the national average, reaching 10.6 deaths per 1,000 inhabitants. The gap between birth and mortality rates is significant in some municipalities.

Migration Balance (Immigrants and Emigrants)
The migration balance in Sicilian municipalities is generally negative, except for Termini Imerese, Campofelice di Roccella, Lascari, and Cefalù.

This negative balance is more pronounced in inner areas, while coastal areas show a less negative or even positive migration balance. The gap in migration balances between municipalities is considerable.

Number of foreign residents
The number of foreign residents in Sicilian municipalities is increasing, except for some municipalities like Alimena, Blufi, and Bompietro.
The presence of foreigners is higher in coastal areas, while inner areas generally show fewer foreign residents. The gap between the number of foreign residents in municipalities is significant.

The current situation of the Madonie Park and its 21 affiliated municipalities does not present a balanced condition. According to the latest data provided by the National Institute of Statistics (ISTAT), updated to 2023, the population of the Madonie has undergone a significant decline, particularly evident in recent years.

This decline is attributed not only to the lack of job opportunities in the region, which drives young people to seek employment elsewhere, but also to the presence of an aging population that remains in the area.

In addition to emigration, the lack of essential services and the distance from surrounding provincial capitals, and consequently from the metropolises offering more advanced and diversified services, contribute to the decline. Therefore, the population of the Madonie has decreased in recent years.

The average percentage change in population across the Madonie municipalities between 2013 and 2023 is -7.2%. This indicates a slight demographic decline but with a contained overall reduction. However, this decrease is more noticeable in smaller municipalities with fewer people. This phenomenon is linked to various factors, such as urbanization, population aging, and the lack of job opportunities, which have potential negative consequences, including the closure of public services and businesses, the dete-

Demographic aspects

Data sources:
Istat

RESIDENT POPULATION (TOTAL, MALES, FEMALES)

decreasing

AVERAGE AGE OF THE POPULATION

45,4 years old

BIRTH AND DEATH RATES

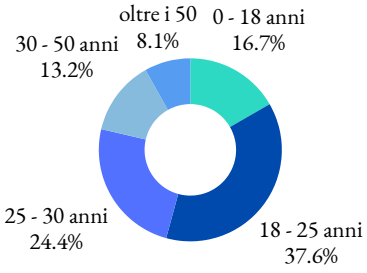
6.8 births per 1,000 inhabitants
10.6 deaths per 1,000 inhabitants

MIGRATION BALANCE (IMMIGRANTS AND EMIGRANTS)

Negative

NUMBER OF FOREIGN RESIDENTS

+ Coastal areas - Foreigners
(-) Inner areas - Italians



DROPOUT RATE BY AGE GROUP

Population density

ELDERLY PEOPLE PRESENT

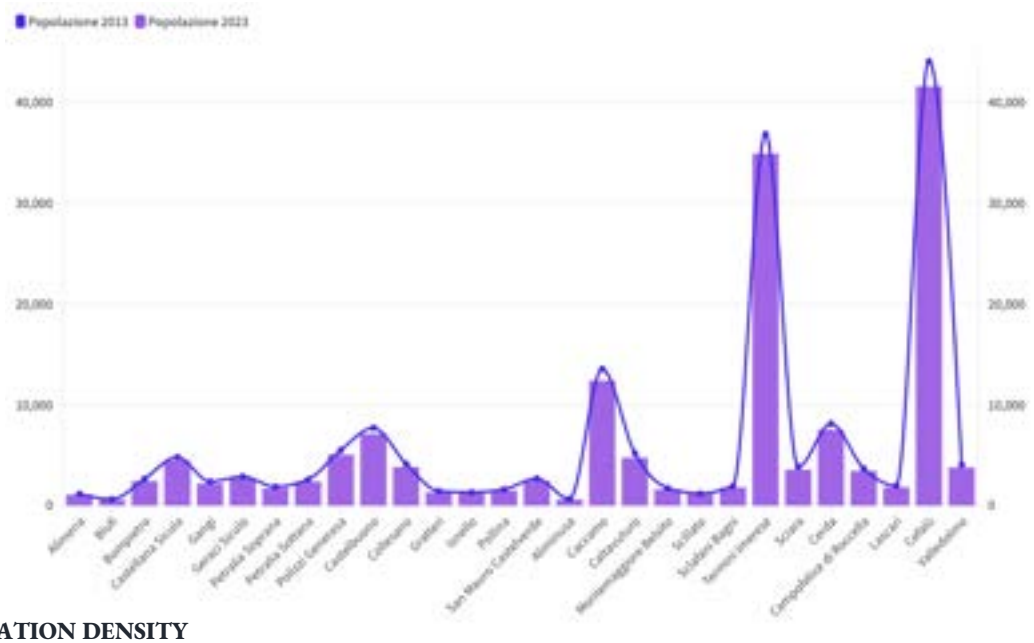
DEMOGRAPHIC CHANGE

Fig. II.2.5 | SWOT Analysis - Demographic Aspects ©Luisa Lombardo, 2023.

Demographic aspects

Data sources:
Istat

POPULATION



POPULATION DENSITY

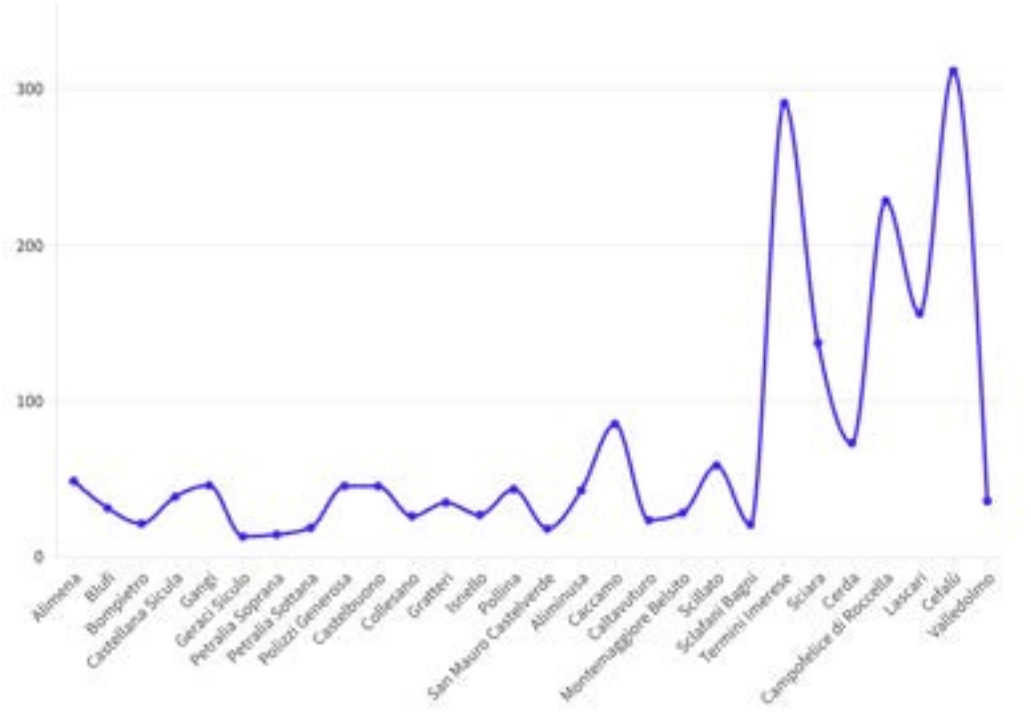


Fig. II.2.6 | SWOT Analysis - Demographic Aspects ©Luisa Lombardo, 2023.

rioration of cultural and environmental heritage, increased crime, difficulty in finding employment, and a decline in quality of life.

The mountainous area of the Madonie covers about 3,000 km², accounting for 60% of the total territory.

The average population density of the municipalities of the Madonie is 22.2 inhabitants per km². The most densely populated municipalities include Cefalù (241.1 ab./km²), Castelbuono (77.2 ab./km²), Polizzi Generosa (56.4 ab./km²), Gangi (55.4 ab./km²), Petralia Soprana (60.2 ab./km²), and Petralia Sottana (58.8 ab./km²). The demographic change over the last 10 years has been negative, with an overall decrease of about 10,000 inhabitants, from 160,000 to 150,000 inhabitants. This decline is attributed to factors such as emigration to cities, population aging, and the lack of job opportunities.

Emigration to cities is the main factor behind the demographic decline of the Madonie, with many people leaving the region in search of job opportunities, mainly in Palermo and Catania. Population aging is another factor, driven by low birth rates and increasing life expectancy. The lack of work is a third factor, with the economic crisis in the Madonie in the past 10 years leading to the closure of many businesses and the emigration of skilled workers.

The percentage of elderly people in the Madonie, according to ISTAT data, is 25.6%, higher than the national average of 23.4%. This phenomenon is linked to the mountainous nature of the region, which has histori-

Lifestyles

Data sources:
Istat

AVERAGE PER CAPITA INCOME	**20.976 euro**
EMPLOYMENT RATE	**58,1 %**
LEVEL OF EDUCATION	**34,8 %**
AVERAGE EXPENDITURE FOR CONSUMPTION	**2.625 euro**
ACCESS TO INTERNET AND DIGITAL SERVICES	**84% internet access** **54% digital services used**

Fig. II.2.7 | SWOT Analysis - Lifestyles ©Luisa Lombardo, 2023.

cally pushed young people to emigrate in search of opportunities elsewhere. The unemployment rate in the Madonie is 10.6%, higher than the national average of 9.1%. This is influenced by factors such as the lack of job opportunities, emigration to cities, and population aging. A current phenomenon in some municipalities of the Madonie is the arrival of new foreign populations. This aims to create new resident populations and contribute to generational turnover.

LIFESTYLES

For an effective SWOT analysis of the Madonie sector, it is crucial to also understand the lifestyles of the local population, focusing on key socioeconomic indicators such as average per capita income, employment rate, education level, and average spending on consumption.

Analyzing the average per capita income helps assess the purchasing power of the population, a key element for understanding spending capacity and thus the economic and tourism development potential of the area. Similarly, the employment rate is a fundamental indicator of economic stability; a high rate suggests a population with good job opportunities, while a low rate could indicate significant challenges that require targeted interventions.

The education level of the population also plays an important role, as a higher education level indicates a greater ability to adapt to changes and innovations, facilitating the implementation of strategies focused on growth and sustainability.

Finally, average consumption spending provides *insight* into local consumption habits, allowing for the identification of potentially expanding economic sectors and the development of products or services aligned with the needs of the territory. In summary, analyzing these factors is essential to precisely outline the inner strengths and weaknesses of the Madonie sector, as well as to identify external opportunities and threats, thus enabling the formulation of targeted and effective strategies for its sustainable development.

Average per capita income

The average per capita income in Sicilian municipalities is below the national average, which is set at 20,976 euros. A higher average per capita income is observed in coastal areas, while inner areas show a lower average per capita income.

Employment rate

The employment rate in Sicilian municipalities is lower than the national average, which is set at 58.1%. A higher employment rate is recorded in coastal areas, while inner areas have a lower employment rate.

Education level

The education level in Sicilian municipalities is below the national average, which is 34.8% of people with a high school diploma. A higher education level is observed in coastal areas, which are more fortunate in terms of services and are also more frequented by tourists. The economy has experienced growth in recent years, while inner areas show a lower education level.

Average consumption spending

Average consumption spending in Sicilian municipalities is lower than the national average, which is set at 2,625 euros. Higher average consumption spending is observed in coastal areas, while inner areas have lower average consumption spending. The gap between the average consumption spending of the municipalities is significant.

Access to internet and digital services

Access to the internet and digital services in Sicilian municipalities is lower

than the national average, with 84% access to the internet and 54% using digital services. Much has been done to implement broadband and wireless connectivity in the district; however, greater internet access and digital service usage are evident in coastal areas, while inner areas have lower access. The gap in internet access and digital service usage between municipalities is significant.

ECONOMY

For a thorough analysis of the economy of the Madonie sector, it is essential to examine several key aspects such as the presence of economic activities, the most developed sectors, GDP per capita, the employment rate, and driving economic sectors.

Assessing the presence and distribution of economic activities in the area allows us to understand the local economic structure and identify any imbalances or areas with development potential. The most developed sectors provide *insights* into where local resources and skills are concentrated, offering a picture of the areas currently supporting the region's economy.

GDP per capita is a critical indicator for measuring productivity and the economic well-being of the population; a high GDP per capita reflects greater production capacity and a higher standard of living, while a lower GDP may suggest the need for economic policies to stimulate growth. The employment rate, closely linked to GDP, reveals the labor market's ability to absorb the available workforce, directly influencing the community's stability and social cohesion.

Finally, identifying the driving economic sectors is essential for understanding which areas of the local economy have the most significant impact on the overall development of the region. These sectors not only define the current direction of the Madonie economy but also offer ideas on where to focus potential investments or economic policy interventions to further support growth. In summary, analyzing these factors is crucial for outlining a comprehensive and realistic picture of the Madonie economy, allowing for the identification of the most effective strategies to promote sustainable and inclusive economic development.

Presence of economic activities (Agriculture, Industry, Tourism)

Agriculture emerges as the predominant economic activity in the Sicilian municipalities, with a great deal of local production and products from the Slow Food chain. Industry, on the other hand, is more prevalent in coastal areas, while inner areas show a lower presence of industrial activities.

Tourism plays a significant economic role for many Sicilian municipalities, especially those located along the coasts. However, the diversification of economic activities is limited in many Sicilian municipalities. The sectoral distribution shows a predominance of services (53.73%), followed by agriculture (23.63%) and then industry (22.65%).

The analysis of the economic structure focused on examining the productive sectors present in the Madonie region.
Primary sector:

- agriculture: agricultural production in the Madonie region is diverse and includes cereals, vegetables, fruits, olives, as well as oil, wine, and cheese;
- livestock farming: livestock farming plays a significant role in the Madonie economy and includes cattle, sheep, goats, pigs, and poultry;
- forestry: the Madonie territory is characterized by forests of beeh, oak, fir, chestnut, and pine trees.

Secondary sector:

- industry: industry in the Madonie is underdeveloped and includes companies operating in the food, textile, chemical, and construction material sectors;
- construction: onstruction plays an important role in the Madonie eco-

Economic aspects

Data sources:
Istat - Economic activities:

PRESENCE OF ECONOMIC ACTIVITIES (AGRICULTURE, INDUSTRY, TOURISM)

Agriculture
Industry in coastal areas
Tourism in coastal areas

NUMBER OF COMPANIES AND EMPLOYEES

(+) Coastal areas
(-) Inner areas

GDP PER CAPITA

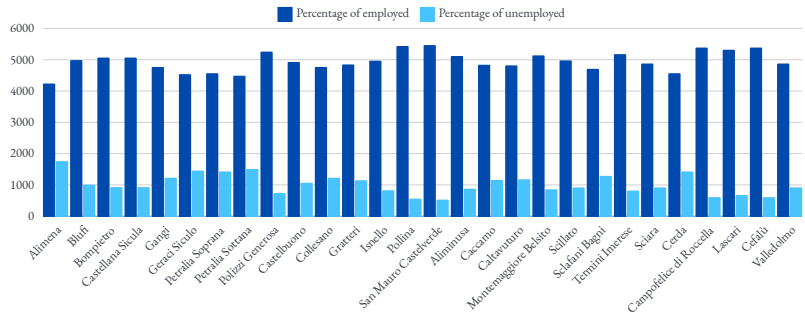
23.500 euro

UNEMPLOYMENT RATE

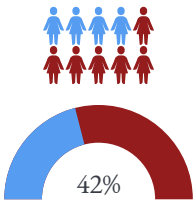
7,8 %

LEADING ECONOMIC SECTORS

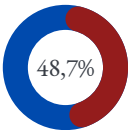
Agriculture
Tourism in coastal areas



Labor market attractiveness index

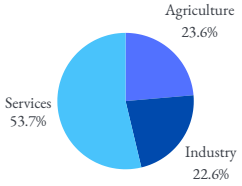


Female employment rate



Employment rate

Unemployment rate



Employed by sector

Fig. II.2.8 | SWOT Analysis - Economic Aspects ©Luisa Lombardo, 2023.

nomy, particularly in the building of homes, hotels, and tourism facilities.

Tertiary sector:

- tourism: tourism is the dominant sector in the Madonie economy, as the region is a renowned tourist destination due to its natural beauty, cultural heritage, and outdoor activities;
- commerce: the commercial sector is significant, with numerous shops, supermarkets, and shopping centers in the municipalities of the Madonie;
- services: the municipalities of the Madonie host various services, including schools, hospitals, banks, public offices, and sports facilities.

The most developed sectors are still the primary and tertiary sectors.

The primary sector, although essential to the economy of the Madonie, is in decline due to urbanization and the lack of investments, but primarily because of the absence of a new generation capable of continuing the ancient cultivation techniques, as well as the inadequacy of technologies that cannot replace the old traditional methods. In contrast, the tertiary sector is growing and constitutes the dominant part of the Madonie economy.

Tourism, in particular, emerges as the most significant sector, with considerable potential for job creation and economic development. The Sicilian regional agro-industrial system is characterized by a strong presence in the primary sector, with particular focus on the production of vegetables, fruits, wine, and olive oil.

The secondary sector is represented by various agro-food industries, such as pasta, preserves, confectionery, and beverages. The tertiary sector includes activities related to the marketing of agricultural products and technical assistance. In the Madonie, the agro-industrial system shows particular development in the production of olive oil, recognized as one of Sicily's main agricultural products.

Thanks to the microclimate and fertile soil, the Madonie is an area suited for the production of high-quality olive oil, appreciated internationally.

Number of businesses and employees

The number of businesses and employees in Sicilian municipalities is lower than the national average in several local contexts. Coastal areas show a higher number of businesses and employees compared to inner areas, highlighting a significant gap between the economic realities of the municipalities.

GDP per capita

The GDP per capita in Sicilian municipalities is below the national average, standing at €23,500. Coastal areas have a higher GDP per capita, while inner areas show an opposite trend, with a lower GDP per capita. This substantial gap highlights significant economic disparities between municipalities.

Unemployment rate

The unemployment rate in Sicilian municipalities is higher than the national average of 7.8%. Inner areas exhibit a higher unemployment rate compared to coastal areas, indicating a marked difference in employment dynamics between different regions.

Key economic sectors

Agriculture remains the leading economic sector in many Madonie areas. Tourism plays a significant role, especially in coastal municipalities, while industry is more prominent in inner areas. The diversification of economic sectors is limited in many areas, indicating the need to promote broader and more sustainable economic development strategies.

Employment rate and activity rate

As highlighted, the employment rate shows considerable variation from one municipality to another. The municipalities with the highest employment rate are San Mauro Castelverde, Pollina, and Cefalù, while the lowest rates are in Alimena, Blufi, and Bompietro.

The average employment rate stands at 48.7%, below the national average of 58.2%. This suggests that residents of these municipalities have a lower likelihood of employment compared to the rest of the country. The female employment rate shows significant differences between municipalities, ranging from 33.7% in Alimena to 48.0% in San Mauro Castelverde. The average female employment rate in the mentioned municipalities is 42.7%, lower than the national average of 48.4%.

The average employment rate, at 48.7%, is lower than the national average of 58.2%, indicating a lower probability of employment for residents of the Madonie municipalities compared to the rest of the country. The average unemployment rate is 11.5%, higher than the national average of 9.1%. The distribution of employed individuals by sector varies across municipalities: the agricultural sector ranges from 18.9% in Cefalù to 35.6% in Blufi; the industrial sector ranges from 17.5% in Termini Imerese to 26.9% in Gratteri; the services sector ranges from 54.1% in Caltavuturo to 57.7% in Castellana Sicula. The overall average shows 23.63% employed in the primary sector, 22.65% in industry, and 53.73% in services. The average unemployment rate in the municipalities is 11.5%, higher than the national average of 9.1%.

The labor market attractiveness index varies between municipalities, identifying those that are more attractive (Pollina, San Mauro Castelverde, Campofelice di Roccella, Lascari, Cefalù) and those less attractive (Alimena, Geraci Siculo, Petralia Soprana, Petralia Sottana, Cerda). The dropout rate by age group ranges from 0.9% to 2.2%, with an average of 1.7%, slightly higher than the national average of 1.3%. This index is calculated taking into account several factors such as the presence of adequate infrastructure, quality of life, availability of skilled labor, and cost of living. A significant variation in the index is observed from one municipality to another, with the minimum value of 46.4% recorded in Pollina and the maximum of 54.9% in Blufi. The average labor market attractiveness index in the municipalities stands at 49.6%. This average value exceeds the national average, set at 47.4%, indicating that the municipalities in question have a greater capacity to attract new businesses and jobs compared to the national average.

To further highlight the disparities in attractiveness, municipalities with high attractiveness, such as Pollina, San Mauro Castelverde, Campofelice di Roccella, Lascari, and Cefalù, are distinguished from those with lower attractiveness, such as Alimena, Geraci Siculo, Petralia Soprana, Petralia Sottana, and Cerda. The analysis of the labor market attractiveness index emphasizes considerable variability between the municipalities considered, with an average index of 49.6%, higher than the national average (47.4%). The most attractive municipalities are Pollina, San Mauro Castelverde, Campofelice di Roccella, Lascari, and Cefalù, while those with lower attractiveness include Alimena, Geraci Siculo, Petralia Soprana, Petralia Sottana, and Cerda.

Therefore, it can be stated that the municipalities under review show a slightly higher dropout rate than the national average. The analysis, considering different age groups, reveals values between 0.9% and 2.2%, with an average of 1.7%, thus slightly above the national average. There is an imperative need to implement targeted strategies to mitigate this trend.

CULTURE AND TRADITIONS

The analysis of culture and traditions in the Madonie area is essential for understanding the identity and cultural vitality of the region, as well as its territorial vocation. A key element is the number and quality of cultural centers, such as libraries, museums, and archaeological sites, which serve as custodians of the local historical and artistic heritage. In addition, churches, castles, and other monuments further contribute to this cultural landscape.

Culture and Tradition

Data sources:
Sicilian Region - Department of Cultural Heritage and Sicilian Identity

NUMBER OF MUSEUMS, LIBRARIES, ARCHAEOLOGICAL SITES	**Agriculture** **Industry in coastal areas** **Tourism in coastal areas**
CULTURAL AND TRADITIONAL EVENTS	**Festivals, fairs, religious events**
CULTURAL AND VOLUNTEER ASSOCIATIONS	**Pro Loco Association, Cultural and Voluntary Association**
PRESENCE OF INTANGIBLE HERITAGE (UNESCO)	**Alimena, Petralia Soprana e Polizzi Generosa**

Language

Data sources:
Sicilian Region - Department of Cultural Heritage and Sicilian Identity

MOTHER TONGUE OF THE POPULATION	**Italian**
SPREAD OF THE SICILIAN DIALECT	**High**
KNOWLEDGE OF FOREIGN LANGUAGES	**Medium - Low**

Fig. II.2.9 | SWOT Analysis - Culture, Traditions, and Language ©Luisa Lombardo, 2023.

The presence of these cultural sites not only enhances the history and traditions of the area but also provides spaces for community interaction and growth.

Cultural and traditional events are another crucial aspect to consider. These events, often linked to religious holidays, seasons, and local traditions, serve as moments of social cohesion and transmission of cultural heritage. Through festivals, fairs, historical reenactments, artistic performances, and religious celebrations, the Madonie region keeps its roots alive and attracts visitors, also contributing to tourism development. Additionally, the presence of local councils and municipal organizations that continue ancient traditions and manage local events plays a key role. Cultural and volunteer organizations are fundamental in the social fabric of the Madonie. These groups often drive cultural and social initiatives, promoting active citizen participation and the dissemination of local culture. Their presence reflects a dynamic community committed to the enhancement of its heritage.

Finally, the presence of intangible cultural assets, such as oral traditions, craft practices, and religious rituals, represents a significant cultural value. These assets, often passed down through generations, form the essence of the local identity and are recognized as integral parts of the Madonie cultural heritage. Safeguarding and promoting these intangible assets is critical to preserving the region's cultural richness and ensuring its continuity over time.

The analysis of culture and traditions in the Madonie allows for a deeper understanding of not only the historical roots of the region but also the cultural and social vitality that defines it, providing valuable *insights* for promoting initiatives that strengthen local identity and enhance community well-being..

Number of churches, museums, libraries, and archaeological sites

The number of cultural assets in Sicilian municipalities is lower than the national average, with the exception of Polizzi Generosa, which boasts a large number of monumental sites spread across its territory. Coastal areas, such as Cefalù with its UNESCO heritage, register a higher number of cultural institutions, attracting tourists from around the world, while inner areas show a less significant presence. This notable disparity highlights cultural and heritage inequalities among the municipalities.

Cultural and traditional events

Each municipality is enriched by numerous cultural, traditional, and religious celebrations, mainly concentrated in the month of August. The inner areas preserve ancient traditions and uninterrupted rituals, passing these cultural treasures down through generations. The summer months see a higher concentration of local events.

Cultural and volunteer organizations

Sicily is home to numerous Pro Loco Associations, Cultural Associations, and Volunteer Organizations, with at least one present in every municipality. These associations play a fundamental role in promoting and safeguarding local cultural heritage. However, they are not currently contributing to territorial development. In fact, there is a lack of European funding initiatives in inner areas by associations, Pro Loco, and APS capable of completing calls for proposals related to activities in the region.

Presence of intangible heritage

Most of the intangible heritage in the region is linked to religious festivals and popular traditions, highlighting the importance of religion and folklore in the lives of Sicilian communities. Some municipalities, such as Alimena, with its UNESCO-listed singing traditions, concentrate a significant number of intangible heritage assets. The presence of these intangible cultural treasures in the Madonie represents a valuable asset for the region, contribu-

ting to its tourism appeal and the promotion of its rich local culture.

LANGUAGE, TECHNOLOGY, AND SECURITY

Analyzing aspects related to language, technology, and the safety of places in the Madonie area is essential to understanding how these elements influence daily life and the development of the territory. Language, with particular attention to the local dialect, which sometimes differs from Sicilian and varies depending on the area, is a cornerstone of the Madonie's cultural identity. The preservation and promotion of the dialect not only safeguard historical memory and traditions but also strengthen the sense of belonging of new generations to their land.

Technology plays an increasingly central role in the modernization of the region. The expansion of digital infrastructure, such as high-speed internet availability and the integration of advanced technologies in production processes, significantly contributes to the economic competitiveness of the Madonie. The use of technology can improve the efficiency of public services, facilitate access to information, and stimulate innovation. However, it is essential to address the digital divide to ensure that all citizens can benefit from new technological opportunities, preventing certain areas or social groups from being left behind.

The safety of places is a crucial element for quality of life and economic development. A safe environment not only reassures residents but is also a determining factor in attracting tourists and investments. Measures such as the installation of video surveillance systems, good public lighting, infrastructure maintenance, and the active presence of law enforcement agencies help create a safe and welcoming environment.

In summary, an integrated approach that preserves local language and traditions, promotes the adoption of modern technologies, and ensures the safety of the region is essential to support the sustainable development of the Madonie, improving the community's well-being and its ability to attract external resources.

LANGUAGE

- **Mother tongue of the population:** Italian and Sicilian;
- **Spread of the Sicilian dialect:** The Sicilian dialect is still widely spoken in the Madonie, especially in rural and mountainous areas.
- **Knowledge of foreign languages:** Knowledge of foreign languages is still limited, particularly among the middle-aged and older generations.

TECHNOLOGY

<u>Internet and broadband coverage</u>

Internet coverage in the municipalities of the Madonie is generally widespread, with an average of 90%. However, the availability of broadband is still limited in some areas, with an average speed of 10 Mbps; the historic centers lack Free Wi-Fi. Mountain municipalities show the lowest internet and broadband coverage, indicating the need for infrastructure improvements in these regions.

<u>Use of smartphones and computers</u>

The use of smartphones and computers in the Madonie is fairly widespread, with an average of 75% for smartphones and 45% for computers. Municipalities with higher adoption of smartphones and computers are those with younger populations and higher education levels, such as Castelbuno. However, a digital divide persists, particularly in rural and mountainous areas, highlighting the need for initiatives to address this disparity.

<u>E-government</u> **(online public administration services)**

The spread of online public administration services in the municipalities of the Madonie is still limited; while some municipalities have updated transparent administration portals, it is not yet possible to use smart portals, like

Landscape

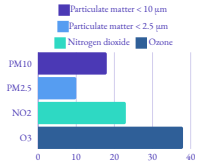
Data sources:
Istat

TERRITORIAL AREA (SQ KM)	**1.649,64 Kmq**
ELEVATION	**(+) Geraci Siculo** **(-) Termini Imerese**
LANDSCAPE TYPE (MOUNTAIN, HILL, PLAIN)	**Alternating landscape**
PRESENCE OF PROTECTED AREAS	**Madonie Park**

Territory

LAND USE (AGRICULTURAL, FORESTRY, URBAN)	**Agricultural and Forest**
WATER RESOURCES	**Mountain springs**
HYDROGEOLOGICAL RISK	**High**
AIR QUALITY	**Excellent**

Air pollution



Biodiversity

Fig. II.2.10 | SWOT Analysis - Landscape and Territory ©Luisa Lombardo, 2023.

those of the Municipality of Palermo, for online administrative procedures. Most municipalities only offer basic services such as registry, certificates, and payments. Few municipalities provide more advanced services, such as online appointment booking or an online counter. The digital divide persists, with mountain municipalities showing the least spread of online services. The same can be said about assistance services, such as SPID.

Presence of ICT companies
The presence of ICT companies in the Madonie is poorly spread, with an average of 2 companies per municipality. However, some companies stand out, such as Caseificio Barreca, an agro-livestock company, the only one in the area to have integrated technologies to improve production. Nonetheless, the digital divide continues to be evident, emphasizing the need to promote the adoption of digital technologies in these areas.

SECURITY
- **Crime rates (crimes against persons and property):** Crime rates in the Madonie are generally low.
- **Presence of law enforcement:** Law enforcement presence is widespread throughout the region.
- **Perception of security by citizens:** The perception of security among citizens is generally high.

LANDSCAPE AND TERRITORY
The differences between landscape and territory are subtle, but significant, especially when analyzing contexts such as that of the Madonie.

Territory primarily refers to a physical space, characterized by natural and artificial components such as mountains, rivers, infrastructure, and human settlements. It is a concept that implies the management and organization of space by humans, with particular attention to planning and the use of resources.

The landscape, on the other hand, is a broader concept and includes not only the physical elements of the territory but also the aesthetic and cultural perception people have of it, as well as the protection and conservation principles currently in place in the area. The landscape is thus the result of the interaction between humans and the environment, reflecting the history, traditions, and emotions associated with a place. With these premises, we can now introduce a specific analysis of the landscape and territory of the Madonie:

LANDSCAPE
- **Territorial surface (km^2):** The territorial surface is 1,649.64 km^2;
- **Altitude:** The maximum altitude is recorded in Geraci Siculo, at 1,050 m above sea level, while the minimum is in Termini Imerese, at 50 m above sea level;
- **Landscape type (mountain, hill, plain):** Mountains, hills, and plains alternate, creating a unique and evocative landscape, with mountainous reliefs being the most prevalent;
- **Presence of protected areas:** The UNESCO Geopark of the Madonie.

TERRITORY
Land use **(agricultural, forestry, urban)**
The prevalence of agricultural and forestry use indicates a rural economy and a strong connection to tradition. The diversification of crops and the adoption of sustainable agricultural practices can help preserve soil fertility and biodiversity.

Water resources
The abundance of mountain springs is a strength for the territory, with thermal areas and even snowfields scattered throughout, as well as natural

water sources that remain untapped, as recently discovered in Polizzi Generosa. Efficient management of water resources is essential to ensure their availability for future generations. Investments in infrastructure and innovative technologies can reduce waste and improve irrigation efficiency.

Hydrogeological risk

The high hydrogeological risk in some areas requires safety interventions for the territory. Urban planning and the creation of soil defense works can reduce the risk of landslides and floods. Raising awareness among citizens about hydrogeological risks is crucial for the prevention of damage and disasters. A large part of the territory presents vulnerable and fragile sections, as it is located in seismic zone 2, meaning it has medium-high seismicity.

Air quality

The good air quality in most of the municipalities is a positive factor for the health of the citizens. Air pollution in coastal municipalities is concerning and requires containment measures. Promoting sustainable mobility and adopting clean technologies can contribute to improving air quality.

Some municipalities, such as Alimena, Blufi, Bompietro, Castellana Sicula, Gangi, Geraci Siculo, Petralia Soprana, Petralia Sottana, Polizzi Generosa, Castelbuono, Collesano, Gratteri, Isnello, and Pollina, are located in mountainous areas characterized by a relatively uncontaminated environment. In contrast, other municipalities, including San Mauro Castelverde, Aliminusa, Caccamo, Caltavuturo, Montemaggiore Belsito, Scillato, Sclafani Bagni, Termini Imerese, Sciara, Cerda, Campofelice di Roccella, Lascari, and Cefalù, are situated in flat areas with a more anthropized environment, thus more polluted.

In general terms, the environmental state of the area is positive; however, there are some issues that require intervention. One of the major concerns is air pollution, mainly attributed to vehicular traffic and industrial activities. Deforestation is another significant issue, primarily caused by the expansion of agricultural activities and urbanization; similarly, the introduction of non-native vegetation is a problem related to the risk of maintaining biodiversity. The environmental analysis has highlighted that some municipalities in the Madonie maintain a relatively uncontaminated environment, particularly those bordering the large Madonie Park, which fall under zones A and B (integral and general reserve). However, other areas, especially in coastal and urban zones, present a higher degree of anthropization. Air pollution, arising from traffic and industrial activities, represents a relevant challenge, as well as water pollution and deforestation. While remaining within legal limits, certain areas show specific criticalities.

In general, pollution levels from PM10, PM2.5, NO2, and O3 are below the limits set by Italian and European regulations. However, some criticalities emerge:

- **PM10:** Termini Imerese shows a PM10 value (22 $\mu g/m^3$) higher than the average (18 $\mu g/m^3$) and the legal limit (20 $\mu g/m^3$);
- **PM2.5:** Termini Imerese (13 $\mu g/m^3$) and Cefalù (12 $\mu g/m^3$) present PM2.5 values higher than the average (10 $\mu g/m^3$) and the legal limit (5 $\mu g/m^3$);
- **NO_2:** Termini Imerese (27 $\mu g/m^3$) and Caccamo (25 $\mu g/m^3$) record NO_2 values higher than the average (23 $\mu g/m^3$) and the legal limit (40 $\mu g/m^3$);
- **O_3:** All municipalities, except for Pollina and San Mauro Castelverde, exceed the legal limit for O_3 (40 $\mu g/m^3$).

Pollina and San Mauro Castelverde stand out for having lower values of all pollutants. In general, mountain and rural municipalities tend to have cleaner air than coastal and urban municipalities for the reasons mentioned above.

By comparing the ISTAT data with previous years, there is a general de-

[1] **PM10 e PM2.5:**
- PM10: Fine particulate matter with an aerodynamic diameter of less than 10 micrometers (μm).
- PM2.5: Fine particulate matter with an aerodynamic diameter of less than 2.5 micrometers (μm).

Fine particulate matter consists of a mixture of solid and liquid particles suspended in the air. They are classified based on their aerodynamic diameter, which determines their ability to penetrate the respiratory system.

PM10 and PM2.5 are the most dangerous for human health because they can reach the lungs and the bloodstream.

Exposure to these particles can cause various respiratory and cardiovascular diseases, such as asthma, bronchitis, pneumonia, and lung cancer.

NO_2: Nitrogen dioxide: A toxic gas primarily produced by the combustion of fossil fuels, such as diesel and methane. Exposure to nitrogen dioxide can cause various respiratory diseases, such as asthma, bronchitis, and bronchiolitis.

O_3: Ozone: A gas that occurs naturally in the atmosphere, but its concentration can increase due to air pollution. Exposure to ozone can cause various respiratory diseases, such as asthma, bronchitis, and irritation of the eyes, nose, and throat.

crease in pollution levels in all municipalities. This positive trend is mainly attributed to the improvement in combustion technologies and the adoption of more stringent environmental policies aligned with the principles of Agenda 2030.

The **Biodiversity Index** (IBI) is a composite indicator used to quantify the biodiversity of a specific area. This index is determined by considering various parameters, including species richness, species abundance, and genetic diversity. The values of the IBI range from 0 to 5, where higher scores indicate greater biodiversity. For ease of assessment, biodiversity has been classified into three categories:
- low: IBI < 4
- medium: 4 <= IBI < 4.5
- medium-high: IBI >= 4.5

Analyzing this perspective, some municipalities emerge with higher biodiversity. Termini Imerese, a primarily industrial area, stands out for having lower biodiversity compared to the other municipalities considered.

It is crucial to emphasize that biodiversity is a fundamental element for the health of ecosystems and human well-being. The loss of biodiversity is a serious issue, as it threatens crucial aspects such as food security, water quality, and, ultimately, human health. This highlights the critical importance of adopting measures to preserve natural habitats and wildlife species.

In this context, it is imperative to protect biodiversity through the implementation of strategies aimed at conserving natural habitats and safeguarding wildlife species. The variability of the biodiversity index among the municipalities highlights those with higher and lower biodiversity, guiding attention toward areas that require special focus in the conservation of biological diversity.

LOGISTICS

Distance

In accordance with the SNAI Strategy, the Partnership Agreement identifies the inner areas as the set of municipalities included in intermediate, peripheral, and ultra-peripheral areas. This is the result of identifying the poles and classifying the remaining municipalities into four distinct categories (intermediate, peripheral, ultra-peripheral), based on the calculation of the distance between the most peripheral areas and the central reference municipalities. This division also applies to the Madonie Area, as shown in the figure.

Altitude

The territory of the Madonie can be further subdivided into three areas: Alta and Bassa Madonie, and Madonie Imerese. These subdivisions do not reflect the area's altitude, as they may include places with variable elevations above and below sea level, even though they belong to different categories.

BUILDINGS AND UNUSED HERITAGE

BUILDINGS

Occupied buildings

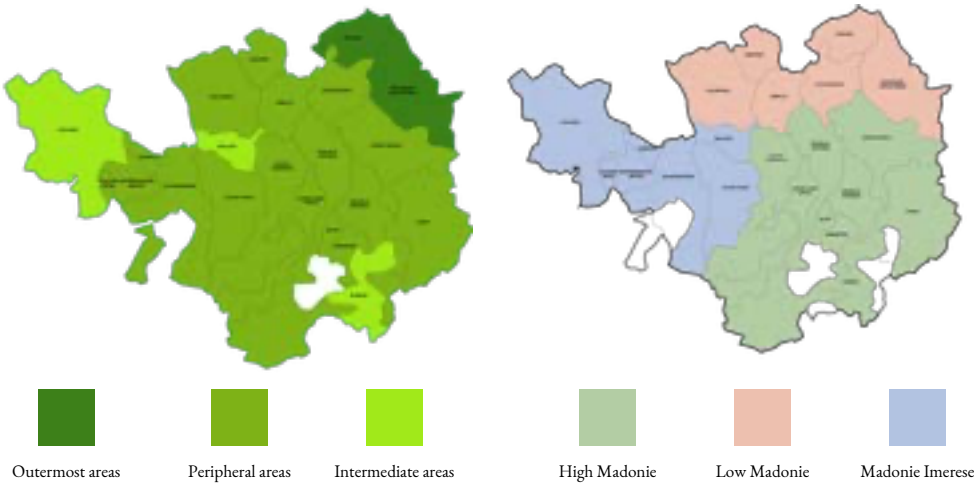
The total number of buildings in the Sicilian municipalities amounts to about 45,000 units. Of this number, approximately 36,000 are residential, while the remaining 9,000 are classified as non-residential.

In recent years, there has been a decrease in the number of residential buildings, unlike an increase in the number of non-residential buildings.

This trend may be attributed to the phenomenon of depopulation in rural areas and the tendency for populations to concentrate in urban zones.

In analyzing the municipalities, it emerges that Termini Imerese, Cefalù, and Castelbuono have the highest concentration of buildings, while Blufi, Bompietro, and Gratteri register the lowest number of buildings. It is worth noting that the ratio of residential to non-residential buildings varies greatly

Distance and Elevation



	Comune	Km²
ALTE MADONIE	Alimena	59,7
	Blufi	20,5
	Bompietro	42,4
	Castellana Sicula	72,5
	Gangi	127,1
	Geraci Siculo	112,0
	Petralia Soprana	56,0
	Petralia Sottana	178,4
	Polizzi Generosa	134,7
BASSE MADONIE	Castelbuono	60,5
	Collesano	108,0
	Gratteri	38,0
	Isnello	50,2
	Pollina	49,0
	San Mauro Castelverde	114,0
IMERESE	Alimnusa	13,0
	Caccamo	188,2
	Caltavuturo	97,2
	Montemaggiore Belsito	31,0
	Scillato	30,8
	Sciafani Bagni	136,8
	TOT	1.720,1

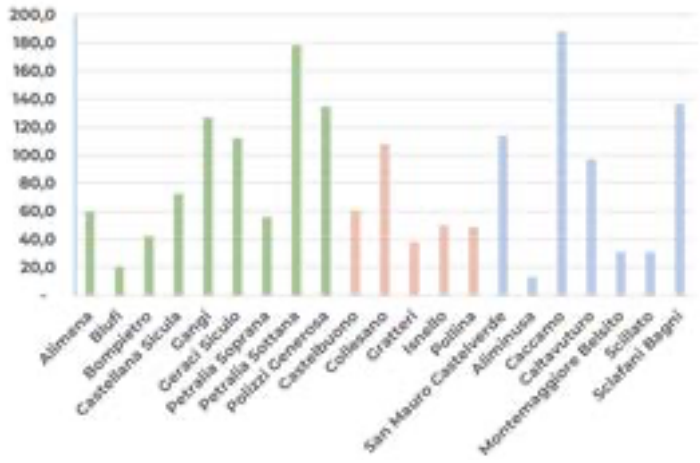


Fig. II.2.11 | SWOT Analysis - Distance and Altimetry ©Luisa Lombardo, 2023.

from municipality to municipality. For example, in Termini Imerese, the ratio is 4:1, while in Scillato, it stands at 3:1.

Unused buildings

As for unused buildings, the Italian government has long recognized the need to adopt legislative measures to address the aging of the building heritage, especially in light of the significant European funds available for regenerating inner areas. These territories, often peripheral and primarily agricultural in nature, such as small inner villages, suffer from serious problems like depopulation, lack of employment, and an aging population, accompanied by a low presence of young people (Campisi, T., Colajanni, S., Lombardo, L., 2022). The 2011 Istat census of Italy's real estate found approximately 743,435 unused residential buildings, with a higher concentration in Southern Italy and the Islands, including Sicily. Currently, Sicily has 131,098 unused buildings.

The issue of abandoned buildings opens the door to rehabilitation and enhancement initiatives aimed at combating abandonment and creating new development opportunities for local communities. One of the best-known initiatives is the "**1-euro homes**"[1] project, which has attracted about 7,000 Italian citizens and received over 2,000 participation requests. So far, 108 homes have been allocated in various Italian regions, while 60 are currently for sale, and about 32 agricultural lots are yet to be assigned. This project, incentivized by building bonuses, aims to revitalize inner areas and abandoned villages, stimulating the real estate market, tourism activities, and the creation of widespread accommodation facilities.

In Sicily, the "1-euro homes" project has also achieved positive results. These interventions are part of a broader territorial development strategy, which aims not only at building rehabilitation but also at promoting new models for the use of cultural heritage.

The discrepancies between various Sicilian municipalities regarding unused buildings are significant. Municipalities such as Cefalù, Caccamo, and Castelbuono show the highest percentages of unused buildings (23.7%, 21.3%, and 20.1%, respectively). In contrast, locations such as Termini Imerese (6.3%), Sciara (6.7%), and Gratteri (7.2%) show the lowest percentages. There is no clear geographical trend, but it is evident that there is a greater concentration of unused buildings in the mountainous areas of Sicily.

Numerous regeneration projects, such as "Vitti a tia" in Polizzi Generosa, and the involvement of foreign investors, demonstrate that the rehabilitation of abandoned buildings not only combats depopulation but also contributes to economic growth and the tourist enhancement of inner areas. Initiatives like these are essential to ensure a sustainable future for local communities, transforming unused building heritage into a strategic resource for development.

Final SWOT Analysis for the Madonie Park

From this comprehensive analysis conducted (*Fig. 10*) within the Madonie Park, it is summarized that:

Strengths:

- **Historical and Artistic Relevance:** IThe Madonie Park is characterized by its profound historical, artistic, architectural, and especially natural significance;
- **UNESCO Designation:** In 2015, the park was granted the prestigious UNESCO Global Geopark status, confirming its international recognition. It is therefore a privileged territory;
- **Varied Landscapes and Caves:** The geological features, diverse landscapes, and fascinating caves attract both scholars and visitors.

Opportunities:

- **Sustainable Tourism:** Capitalizing on the natural and architectural heritage to attract sustainable tourism and engage new generations;
- **Production of Local Products:** Promoting high-quality local pro-

[1] The book "Houses for 1 € in the Villages of Italy. Sambuca di Sicilia: A Successful Example in Land Management" offers a multidisciplinary reflection on the experience of 1-euro houses in Sambuca di Sicilia, involving urban planners, sociologists, local development and European project experts, tourism analysts, legal professionals, and local administrators. Through various methodological approaches and diverse linguistic registers, the volume analyzes the peculiarities of this initiative, its global media impact — over 100,000 emails from all over the world, coverage on international broadcasters, and the completion of numerous property sales — and the reasons behind its success. At the same time, it tells the story of a community and a village that, by rethinking their evolutionary trajectory, managed to mobilize visions and resources for the revitalization of the territory.
Ferreri, F. (2021). Case a 1 € nei borghi d'Italia. Sambuca di Sicilia: un esempio di successo nel governo del territorio. Dario Flaccovio Edi-

ducts, including Slow Food items, to contribute to territorial excellence and economic sustainability.

Weaknesses:

- **Depopulation:** The region faces the challenge of depopulation, with young people moving to urban centers;
- **Lack of Employment Opportunities:** The lack of profitable job opportunities and innovative entrepreneurial initiatives hinders sustainable progress.

Threats:

- **Decline in Vitality:** Depopulation and lack of employment opportunities pose threats to the gradual decline in vitality;
- **Loss of Economic Vitality:** Failure to address these challenges could lead to further decline and loss of economic vitality.

The Madonie Park boasts a rich heritage but faces significant challenges related to depopulation and the lack of economic opportunities. To fully harness its potential, it is crucial to promote sustainable tourism, enhance local products, and encourage innovative entrepreneurial initiatives. Investment in research, innovation, and architecture can help develop sustainable solutions to address the region's unique challenges, ensuring a prosperous future for the Madonie Park.

The SWOT analysis of the Madonie Park reveals a reality full of potential but also burdened by substantial challenges. Its designation as a UNESCO Global Geopark and unique geological features provide a solid foundation for sustainable development and tourism. However, depopulation and lack of employment opportunities are real threats that require a strategic response (Di Prima et al., 2013).

It is encouraging to note that the region's historical and architectural heritage could present an opportunity to attract new generations and innovative businesses. Promoting sustainable tourism and valorizing local products, particularly those in the Slow Food movement, can significantly contribute to territorial excellence and economic sustainability.

However, to successfully address the challenges of depopulation and lack of employment opportunities, a holistic approach involving research, innovation, and architecture is crucial. Sustainable and technological solutions can emerge to meet the region's unique needs, thereby ensuring a prosperous future for the Madonie Park. Ultimately, this analysis underscores the importance of strategic management and targeted interventions to preserve and enhance this natural and cultural heritage. Addressing current challenges may not only preserve the region's economic vitality but also ensure that the Madonie continues to be a unique gem, appealing to present and future generations.

The *insights* provided aim to offer a new summary framework in light of the latest SNAI dynamics and the censuses conducted to not only highlight existing problems but also evaluate and enhance what is already present or could be developed in a proactive manner. The data analyzed so far, derived from as far back as 2015, represent a period that does not fully account for the significant changes and dynamics in the region. It is, therefore, essential to consider the territorial peculiarities to identify, in the context of promoting *Smart Villages*, any element that could be useful or even decisive in identifying strategies and opportunities to achieve the research objectives and goals.

SWOT ANALYSIS

STRENGTHS	WEAKNESS
The Madonie Park is a vast natural area of profound historical, artistic, architectural, and natural value. It is the second-largest green area on the island and, in 2015, received the prestigious designation of UNESCO Geopark. The park's geological features, diverse landscapes, and fascinating caves attract researchers and captivate visitors. The twenty-one villages within the park thrive as guardians of the landscape, contributing to the region's rich history. The production of high-quality local goods, including certified Slow Food products, enhances the area's excellence and accounts for 60-70% of Sicily's local products.	The Madonie region faces the challenge of depopulation, leading to a gradual decline in the vitality of many towns and hamlets. The exodus of young people to urban centers is a significant issue, driven by the search for employment opportunities, services, and a more dynamic environment. The lack of profitable job opportunities and innovative entrepreneurial initiatives hinders sustainable progress.
OPPORTUNITIES	**THREATS**
The exceptional aesthetic, historical, and architectural heritage of the Madonie region offers opportunities to attract new generations and innovative businesses. Research, innovation, and architecture can address the needs of the territory. Sustainable and technological solutions are emerging to meet the unique requirements of the region.	The challenges of depopulation, declining vitality, and lack of job opportunities pose significant threats to the future of the Madonie region. Failing to address these issues could lead to further decline and a loss of economic vitality.

Fig. II.2.11 | SWOT Analysis - Madonie ©Luisa Lombardo, 2023.

Fig. II.2.12 | Madonie Landscape ©Luisa Lombardo, 2023.

II.2.2 Questionnaires and surveys. Participatory approach with the community

The quantitative method was then complemented by a qualitative one through a questionnaire administered during the Summer School[1] (see Ch. III.1.1.1) focused on the inner areas; a fundamental tool for collecting detailed and contextualized information on the perceptions and experiences of the local community beyond the objective data available. Unlike more structured and numerical methods, the questionnaire allowed for the exploration of subjective and relational aspects, offering a deep and complex view of territorial and social dynamics. The questionnaires were designed to stimulate open-ended responses, giving participants the space to freely express their opinions, needs, and concerns regarding their everyday environment.

This approach facilitated the collection of meaningful data, enabling the exploration not only of tangible problems related to services or infrastructure but also of more intangible aspects such as a sense of belonging, the impact of difficulties on quality of life, and the community's vision of the future. The responses provided by residents painted a realistic picture of local issues, helping identify the most urgent challenges and opportunities for improvement, as well as collecting ideas on how to actively involve the population in change processes.

Moreover, the qualitative method through the questionnaire allowed for a certain flexibility in the investigation, enabling participants to respond with depth and detail, unlike closed or structured surveys. The information collected was then analyzed thematically to identify recurring patterns, common concerns, and shared expectations, offering an important starting point for developing policies and interventions that truly address the needs of the community. The questionnaire administered is part of the European SIAS2 project, which aims to revitalize the cultural heritage of rural areas in Sicily (Gadda, 1941). The main goal of this investigation was to give citizens a direct voice, allowing them to express needs and expectations that often do not emerge through traditional institutional channels. The collaboration with doctoral candidates from the Department of Architecture at the University of Palermo, Alejandro Gana Nunez and Desiree Saladino, from the urban and sociological fields, helped structure the questionnaire to collect relevant data that could provide a precise picture of the local social and territorial dynamics.

The questionnaire focused on key themes such as available services, the community's sense of belonging, and the most critical issues residents face daily. Particular attention was given to understanding the impact of these difficulties on the lives of inhabitants, especially the most vulnerable population groups, such as the elderly and disabled, as well as the causes of depopulation, which has resulted in a lack of young people in the area. At the same time, possible interventions to attract new resources, such as students or associations, were explored, with the aim of promoting the development of innovative projects that could address territorial challenges and foster sustainable growth in the area.

Through the collection of detailed information on the needs, concerns, and potential of the communities, the questionnaire served as a key tool to guide local administrations toward more suitable and informed policies that reflect the real needs of the population. In this way, the initiative contributed to strengthening the bond between the local community and institutions, laying the foundation for targeted interventions that can generate a positive and lasting impact on the inner areas, while also taking into account other questionnaires already conducted in the area in the years preceding the Research (see Territorial Surveys Madonite Sheet on page 225).

Structure of the Questionnaire

Section 1: Personal information

This section collected demographic data from participants, including email, municipality of residence, municipality of birth, year of birth, number of

[1] The European project SIAS2 - Sicilian Inner Areas Summer School: Valorizing Cultural Heritage through Community Engagement, recognized as Urban Thinker Campus 9.0 by UN-Habitat, took place from August 26 to September 2, 2024, involving the municipalities of Palazzo Adriano, Isnello, Polizzi Generosa, and Petralia Sottana. Designed and coordinated by PhD candidates Samuele Morvillo and Luisa Lombardo from the University of Palermo, SIAS2 adopted *Design Thinking* to enhance cultural heritage and promote the regeneration of Sicily's inner areas. Funded by the European Solidarity Corps and supported by local and international partners, the project saw the participation of students and researchers who worked on topics such as culture, tourism, accessibility, and services, culminating in the presentation of concrete projects for sustainable development. SIAS2 represents a virtuous example of *co-design* and innovation applied to territorial contexts, highlighting the importance of dialogue between communities, local administrations, and academic research.

family members, and the highest level of education attained, with options ranging from elementary school to university degree and beyond. Additionally, participants were asked if they had attended any training or professional development courses in the past 5 years, and if so, to specify the name of the course. The section continues with questions about the participant's current employment status (employed, unemployed and seeking work, student, retired, or other) and, for those employed, the industry sector (agriculture, industry, services, public administration, or other).

Section 2: Evaluation of the territory
This part aims to gather opinions on the services in the municipality of residence. Participants are asked for their views on the quality of services such as healthcare, education, public transportation, social services, and access to digital services (internet connection, digital payments, etc.).
Participants are asked to rate their satisfaction with these services on a scale from very dissatisfied to very satisfied.
They are also asked if they participate in local cultural activities (regularly, occasionally, or never) and to evaluate the sense of community, cultural heritage promotion, and tourism stimulation in the municipality.
The section also addresses the topic of emigration, asking if participants have ever thought about leaving the municipality and, if so, for what reasons (work, access to services, quality of life, family reasons, studies, other).
Other questions concerned the municipality's environmental resources (forests, parks, watercourses, agricultural areas) and whether they believe these resources are adequately protected. Participants are also asked to identify the main needs of the municipality (improvement of healthcare services, public transport, job opportunities, etc.) and to provide suggestions on how to address them.
The section concludes with an assessment of the accessibility of public services for people with disabilities or elderly individuals, and opinions on urban decor aspects such as street cleanliness, maintenance of green areas, street furniture, waste management, and accessibility of public buildings.

Section 3: Specific issues and proposals
This section explores the main challenges identified by participants in their municipality, such as depopulation, lack of essential services, unemployment, pollution, and inadequate infrastructure.
It examines how these challenges affect quality of life and what potential the municipality holds, with options such as tourism, sustainable agriculture, local craftsmanship, cultural heritage, and technological innovation.
It also assesses whether the municipality's cultural and natural heritage is adequately promoted, and if not, which aspects require more protection or promotion.
The questionnaire includes questions about the knowledge of public funding received by the municipality in recent years (such as PNRR, SNAI, or Regional Funds) and how these funds have been used, as well as suggestions on how to invest these resources to enhance the territory.
Finally, it explores opinions on the local community's openness to adopting new technological services (such as telemedicine, e-commerce platforms, smart city, coworking, sustainable mobility) and the most important cultural events in the municipality (religious festivals, fairs, carnivals, theatrical performances, music festivals).
Participants are asked which local traditions or customs have been lost and which could be recovered, as well as what changes they would like to see in the municipality over the next 10 years.

Methodology
The questionnaire was administered in both digital and paper formats and includes a combination of closed-ended questions, which allow for the collection of quantitative data, and open-ended questions, which enable parti-

cipants to provide more detailed and qualitative responses.

It was structured to cover various aspects of community life, from public services and quality of life to issues of cultural identity and economic development. The questionnaire was designed to gather detailed information on the perceptions, expectations, and suggestions of the local population regarding the current and future conditions of rural areas.

The survey was administered to a sample of 300 participants, selected based on criteria of geographical, social, and economic diversity, ensuring a balanced representation of different age groups, educational levels, and professional status.

Methodological phases

Definition of objectives: the questionnaire was designed to gather data on three main dimensions:

- **Quality of essential services** (healthcare, education, transportation, digital access);
- **Perception of the territory** (cultural heritage, community attachment, development opportunities);
- **Proposals for the future** (solutions to counter depopulation and improve quality of life).

Sampling: The sample of 300 participants was selected considering different interest groups: permanent residents, young people who have left or still live in the area, elderly individuals, local professionals, entrepreneurs, and representatives of local institutions or associations. This ensured a diversified perspective on problems and potential solutions.

Administration: The questionnaire was distributed both in paper and online formats, ensuring accessibility to all demographic targets, especially those living in areas with limited digital connection or low literacy. A pre-test was conducted on a small sample to refine the phrasing of the questions, ensuring clarity and understanding.

Data Analysis: Responses were collected and analyzed using both quantitative and qualitative methods. Closed-ended responses were subjected to statistical analysis to identify trends and patterns, while open-ended responses were analyzed through content analysis methods to identify recurring themes and innovative proposals.

Types of Questions Administered

The questionnaire was structured into five main sections, each with a mix of closed-ended questions (multiple choice or Likert scale[1]) and open-ended questions to gather detailed comments and personal suggestions.

1. Personal and demographic information

This section aimed to gather basic information about the participants to understand their background. The questions included:

- age;
- gender;
- level of education;
- current occupation;
- residence (whether the participant still lives in the area or has moved).

2. Assessment of local services

Likert scale questions from 1 to 5 (1 = very dissatisfied, 5 = very satisfied) related to the quality of key services in the area:

- Healthcare and access to medical care;
- Education (availability of schools, quality of teaching);
- Transport and mobility (frequency of connections, access to public transportation);

[1]Mathsly Research. (2020). Scala Likert: approccio statistico. Retrieved September 16, 2024, from https://www.mathsly.it/wordpress/scala-likert/

- Access to digital services (internet coverage, connection speed);
- Public infrastructure (roads, lighting, municipal services).

3. Perception of the area
In this section, participants were asked to express their level of agreement (on a scale from 1 to 5) with various statements about their attachment to the area and quality of life:
- "I feel connected to my local community."
- "The cultural heritage of my area is adequately valued."
- "I believe my municipality offers opportunities for young people."
- "I feel confident staying in this area for the next 5 years."

4. Challenges and Issues
Open-ended questions to gather personal opinions on the main issues in the area:
- What do you think are the main challenges in your municipality or the inner area where you live?
- What do you think is causing the depopulation of your area?
- What services do you consider most lacking, and what would you suggest to improve them?

5. Proposals for the future
This section aimed to gather concrete ideas and solutions from the participants:
1. "What initiatives do you think could help counteract depopulation?"
2. "How do you think the cultural and natural heritage of the area could be better valued?"
3. "How could young people and students be involved in territorial development projects?"
4. "Which funds or resources do you think could be better utilized to improve services and infrastructure?"

Critical Interpretative Analysis of the Responses and Scenarios
Section 1: Personal information
The data collected show a population predominantly made up of people aged over 50, with a significant presence of retirees and elderly people in the 50+ age group. The youth demographic (18-35 years old) is small, with few students or workers, highlighting a clear phenomenon of youth depopulation. Many young people have left the municipality primarily for study or work reasons, with most of the younger participants living outside the area, particularly in the Palermo, Catania, or Messina provinces, but maintaining ties with their hometown mostly for family reasons.

The education level is generally medium, with a majority having completed secondary school. Only a minority has attended training courses or professional development programs in the past five years, suggesting a possible lack of educational opportunities in the area.

Section 2: Assessment of the territory
The majority of participants express dissatisfaction with the essential services provided by the municipality. The most criticized sectors are::
- **healthcare: t**he elderly population complains about the difficulty of accessing medical services and the shortage of specialized doctors. In particular, the lack of adequate facilities for elderly care and home assistance services, along with the imminent closure of the "Madonna SS. dell'Alto" hospital, are highlighted;
- **education:** although primary and secondary schools are rated positively, young people find opportunities for higher education or vocational training limited, forcing many to move to other cities or larger metropolitan areas for university education;

- **transportation:** mobility is a significant issue, with insufficient public transportation and infrequent connections to larger cities. This exacerbates the isolation of the area, making it difficult for young people and families to stay;
- **digital access:** internet connectivity is often slow or non-existent in some areas, limiting the ability to work remotely, access digital services, and promote trade or connect with the rest of the world, contributing to the globalization of these areas.

Despite these problems, many participants show a strong attachment to their local community and emphasize the importance of the sense of community and the cultural and natural heritage of the area. Cultural activities, although limited, are appreciated, but there is a widespread feeling that the enhancement of cultural and environmental heritage is still insufficient or, more often, only encourages short-term tourism.

Section 3: Specific issues and proposals

The main issues identified by participants include:

- **depopulation:** the lack of work and training opportunities is driving young people away, leaving an increasingly elderly population and progressively reducing the vitality of the area. Depopulation also leads to a reduction in services;
- **youth unemployment:** those who remain, especially young people, find it difficult to find work, particularly in the agricultural and manufacturing sectors, which traditionally dominate the local economy. Some young people suggest that the lack of specific training and support from local institutions makes it difficult to develop new entrepreneurial initiatives;
- **lack of area strategies:** participants highlight the lack of a long-term strategic vision for territorial development. While there have been some public investments, their distribution is perceived as ineffective, often fragmented, and not responding to real needs.

Proposed *smart* project ideas

Training and involvement of young people: Many participants see universities and associations as an opportunity to revitalize the area. They suggest creating partnerships with local universities, such as the University of Palermo, to attract students and young researchers who could work on projects related to sustainable development, the enhancement of cultural heritage, and technological innovation, as well as assist local administrations in a virtuous path of valorization.

Participants also propose activating internships and apprenticeships for students, both at the university level and post-high school, linked to the conservation of historical heritage, sustainable tourism, organic farming, and local craftsmanship. This way, young people could gain work skills, creating a connection between education and employment in the area.

Collaboration with associations: Some participants suggest involving local and European youth and cultural associations (e.g., through European Solidarity Corps projects) in organizing events and projects aimed at revitalizing the area. Initiatives such as cultural festivals, training workshops, and volunteer projects could attract young people from all over Europe, contributing to the promotion of local resources and the creation of new social ties, bringing new young people to the area.

An example could be the creation of artistic or musical workshops that use local traditions (such as folk songs, craftsmanship, or typical cuisine) as a tool to create new cultural content, thus attracting a young and international audience.

Enhancement of natural and cultural heritage: Many participants believe the area has untapped potential in the tourism sector. The natural beauty

of the inner areas, combined with the historical, architectural, and cultural heritage, could be used as leverage to attract tourists interested in authentic and sustainable experiences.
Some proposals include the creation of thematic tourist routes (such as food and wine itineraries, nature excursions, and historical routes linked to local traditions), promoting, for example, the conservation of dry stone walls, historic farmhouses, and other rural structures as tourist attractions.

Utilizing external funds and resources: The population emphasizes the importance of accessing new funds, such as those offered by the National Rehabilitationand Resilience Plan (PNRR) and the National Strategy for Inner Areas (SNAI). However, there is an emphasis on the need for more efficient and strategic management of these resources and constant attention to European calls for more effective management of funds available for rural mountainous areas. Respondents suggest that the funds should not only be used to improve essential services but also to create a solid infrastructure for local economic development, such as implementing digital networks and coworking spaces for young entrepreneurs and remote workers.

The scenario outlined by the questionnaire shows an area rich in potential, but hindered by chronic problems such as depopulation and the lack of effective strategies. However, through the involvement of students, young people, and associations, and by more strategically utilizing available resources, there are real opportunities to reverse the trend and regenerate the inner areas.

Fig. II.2.2.1 | Administration of questionnaires to citizens ©Luisa Lombardo, 2024.

MADONITE TERRITORIAL SURVEYS

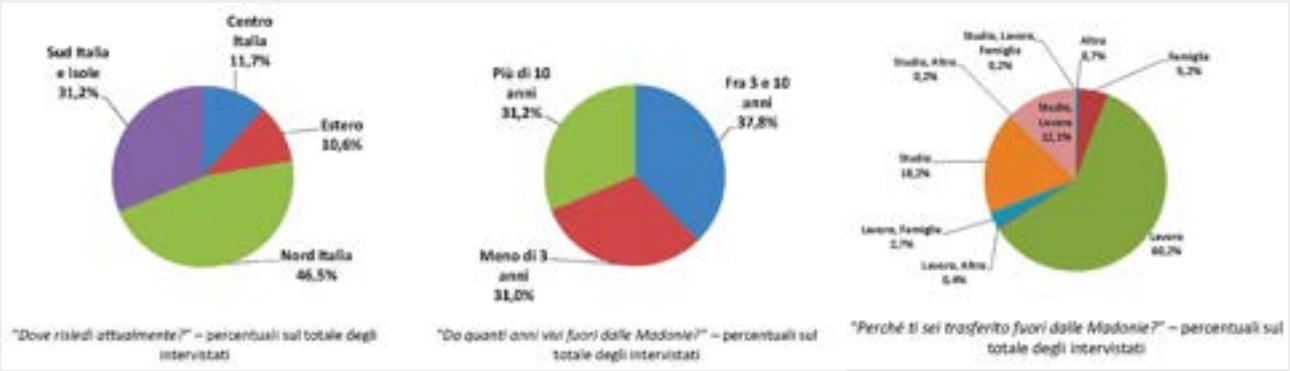


Fig. 1 - Some results of the survey conducted on the Madonie by Fabrizio Barca in 2018. ©Forum Diseguaglianze e Diversità, 2018

The Report 'Madonie Emigrants'

One of the most common mistakes in planning and decision-making processes is not considering those who actually live in the territories being studied and transformed; yet the community is the beating heart of these areas, and without it, there would be neither continuity nor a future. In the Madonie, in 2014, former Minister Fabrizio Barca promoted a survey aimed at understanding the real issues of the territories through a participatory approach, involving a small portion of the community in the decision-making process for the Strategy for Inner Areas. It was a socio-economic study aimed at understanding the aspirations, needs, and desires of the local population and the current living conditions.

The survey was useful for this thesis work to understand, beyond the projects already undertaken from 2018 to the present with the SNAI, what further solutions can be implemented in the Madonie area; a guide for deciding what to propose. Despite the survey being conducted on a small sample and being dated relative to the publication of this thesis, further analyses involved direct contact with the local population through additional contacts and channels.

The survey conducted by Barca in the Madonie was a socio-economic investigation aimed at understanding the living conditions and aspirations of the local population. The survey was conducted on a sample of 2,000 people, representative of the Madonie population. The survey results highlighted a series of critical issues, including:

- a high rate of unemployment and underemployment, with these issues particularly affecting young people;
- a low level of education, with a significant portion of the population not having completed high school;
- a high incidence of poverty and social hardship;
- a widespread sense of abandonment and marginalization by institutions.

The survey also highlighted several strengths, including:

- a strong sense of local identity and a deep connection to the territory;
- a strong entrepreneurial spirit and creativity;
- an important landscape and environmental resource.

The results of the survey had a significant impact on the development policy for the Madonie. The Strategic Plan of the Sicilian Region for the Madonie, approved in 2017, was based on the survey results to define intervention priorities.

Among the objectives of the Strategic Plan are:

- the creation of new jobs, particularly for young people;
- the improvement of education and training levels;
- the reduction of poverty and social hardship;
- strengthening the sense of belonging to the local community.

The Strategic Plan includes a series of interventions, including:

- support for local entrepreneurship, particularly in the tourism, agricultural, and craft sectors;
- investment in education and training, with the creation of new schools and the offering of vocational training courses;
- strengthening social services to combat poverty and social hardship;
- promotion of the culture and artistic and landscape heritage of the madonie.

The results of Fabrizio Barca's survey have contributed to giving a new perspective on the development of the Madonie.

The Strategic Plan, which is based on the survey results, aims to transform the Madonie into an area attractive to young people, businesses, and tourists. Here are some details on the survey results related to specific aspects of life in the Madonie:

- On the employment front, the survey found that the unemployment rate is 25%, with a particularly high incidence among young people (35%). The underemployment rate is 20%;
- On the education front, the survey found that 30% of the population has not completed high school. 25% of the population has completed high school. Only 25% of the population has a university degree;
- On the poverty front, the survey found that 20% of the population lives in absolute poverty. 40% of the population lives in relative poverty;
- On the sense of belonging, the survey found that 95% of the population feels strongly connected to the Madonie.

The results provided a clear snapshot of the situation in the Madonie. The data collected helped define the intervention priorities for the area's development.

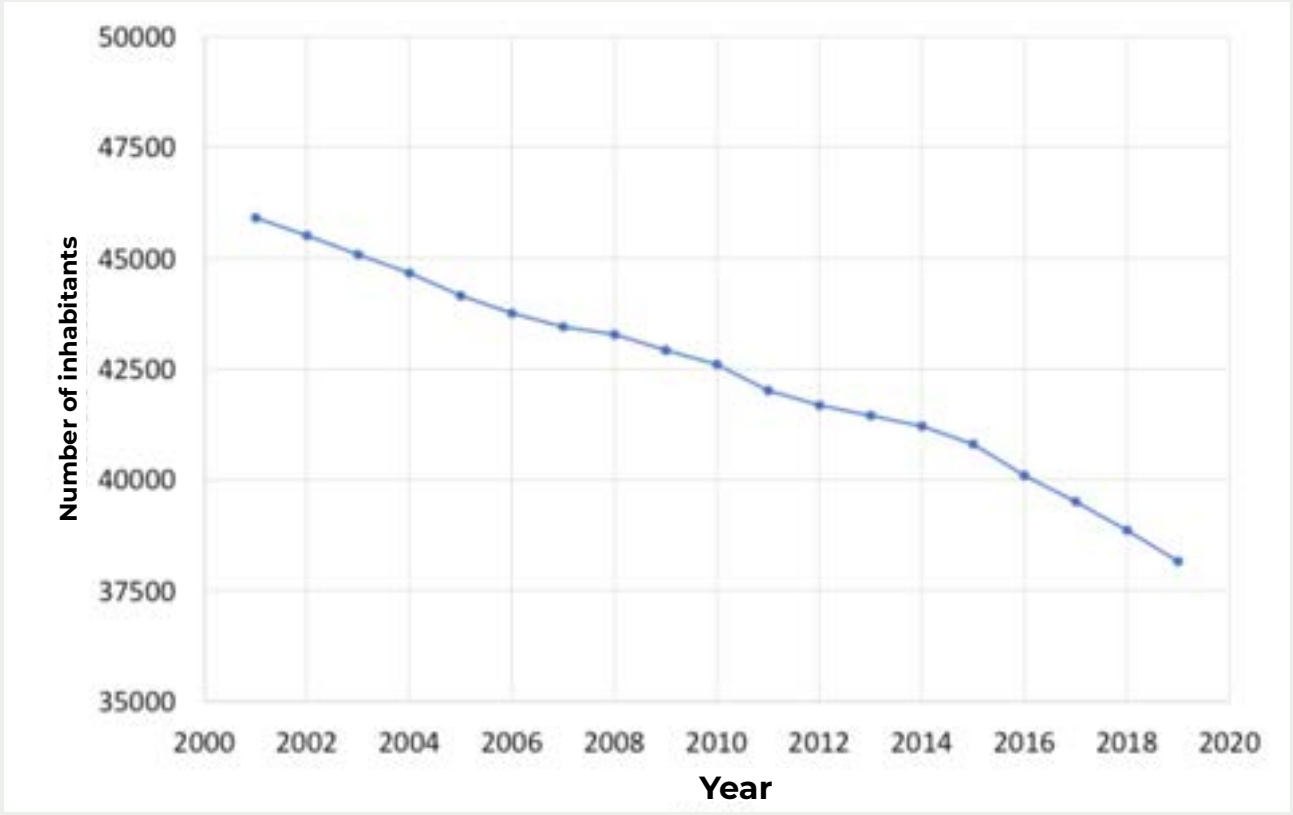


Fig. 2 - Demographic profile of twelve municipalities in the Madonie from 2001 to 2019. (Source: ISTAT), ©Giuseppe Dino, 2019.

II.2.3 Final assessment

The analyses conducted played a crucial role in identifying the issues present in the Madonie territory and in defining the priority strategies for the protection, enhancement, and promotion of *smart villages* in this area. Through this analytical tool, a comprehensive picture of the territorial dynamics and issues was outlined, as well as the main intervention axes necessary to preserve the natural and cultural heritage of the Madonie, while promoting sustainable development that benefits both local communities and visitors.

Firstly, the enhancement of the primary sector represents one of the key directions. The Madonie are renowned for their excellence in agriculture and food production, with a strong presence of Slow Food products (Minerdo et al., 2022) that embody the quality and tradition of the region, contributing to 70% of Sicily's production. The goal is to further strengthen this vocation by promoting local products not only nationally but also internationally, through access to global markets. This requires an integrated approach that combines the preservation of agricultural traditions with innovation, ensuring that these products can compete on a large scale without losing their authenticity.

At the same time, improving the tourism offer is necessary, with particular attention to the management of architectural and monumental heritage. The Madonie are rich in history and culture, and their historic centers, such as that of Polizzi Generosa, represent invaluable heritage that must be protected and enhanced. This includes not only the conservation of historical buildings but also the promotion of sustainable tourism that can fully appreciate the beauty and importance of these places.

The management of forest heritage is another crucial element. The Madonie offer a unique natural environment, with trails and paths that pass through breathtaking landscapes. Promoting accessibility to these places, through the maintenance and improvement of infrastructure, as well as isolated properties or scattered existing architecture, is essential to attract visitors and ensure that tourism can become an economic driver for the area (Lampreu, 2023). Additionally, promoting local culture and traditions, making them an integral part of the tourist experience, and strengthening the cultural identity of the communities are key factors.

Another fundamental aspect is the improvement of services to ensure the accessibility of the sites, making the Madonie an attractive and accessible destination for all. This includes not only physical infrastructure but also the adoption of a smart *governance* system capable of ensuring efficient access to European and national funds. The introduction of participatory democracy processes, through a bottom-up approach, is essential to ensure that decisions reflect the needs and aspirations of the local communities.

Sustainability is another pillar of the strategy, with the goal of improving both indoor and outdoor comfort in the built heritage (D'Ambrosio Alfano et al., 2020). This requires energy efficiency interventions, structural adjustments, and the establishment of energy communities to ensure that buildings are not only safe and comfortable but also environmentally sustainable.

In this perspective, the protection of historic centers (Malo, 2020) in the Madonie assumes a central role. The protection of natural heritage has already been successfully addressed, as evidenced by the inclusion of the Madonie UNESCO Global Geopark. Now, attention is focused on safeguarding the built heritage aimed at repopulating the area, which represents an irreplaceable witness to the local history and culture and plays a fundamental role in the region's revival. The historic centers of the Madonie are not simply inhabited places, but real open-air museums that tell the story of centuries of human settlements, cultural influences, and unique architectures. Their protection is crucial not only to preserve historical memory but also to ensure that these places can be enjoyed by future generations.

Fig. II.2.3.1 | Mikhail Albano in Bompietro, Italy ©IArtMadonie, 2022.

II.3 Research experience at the Superintendency of BB.CC.AA. of the Province of Palermo.

A significant case study in this context is the town of Polizzi Generosa, a case chosen in synergy with the Superintendency of Cultural Heritage of the Province of Palermo. This small settlement, with its narrow winding streets, historic squares, and ancient churches, represents an example of how the conservation of built heritage can go hand in hand with sustainable development. Polizzi Generosa is not only a symbol of Sicily's historical and cultural wealth but also a pilot case of how the protection of architectural heritage can contribute to tourism attractiveness and the economic well-being of the local community. This is why the analysis started from this town in collaboration with the Superintendency of Cultural and Environmental Heritage of the Province of Palermo.

In this regulatory context, the Sicilian Regional Law of 10 July 2015, No. 13, titled "Norms to Encourage the Rehabilitationof the Basic Built Heritage of Historic Centres," represents a fundamental legislative framework to promote the redevelopment of Sicilian historic centres. This law aims to encourage the rehabilitationof historic buildings through measures that facilitate the renovation and enhancement of existing architectural heritage, thus preventing the abandonment and decay that threaten many historic villages. The provisions of the law aim to safeguard the architectural and historical characteristics of buildings while promoting energy efficiency and the structural adaptation necessary to ensure safety and residential comfort.

The subsequent Regional Law of 24 December 2018, No. 24, which introduces amendments to the 2015 law, further strengthened these measures, expanding the possibilities for intervention and simplifying the procedures for the rehabilitationof built heritage. The amendments aim to make the regulatory tools available to local administrations and private entities more effective, further incentivising the rehabilitationand enhancement of historic centres, with particular attention to conservation needs and the promotion of sustainable interventions, supported by technical manuals and guidelines that complement the current urban planning regulations of the municipalities. Finally, but no less importantly, each territory within the Madonie must be able to identify its own genius loci, or its unique territorial vocation. This concept implies the ability to make the best use of local specificities and resources, adapting development strategies to the distinctive characteristics of each area to ensure a sustainable and prosperous future for all the Madonie communities.

The protection and enhancement of the Madonie must follow a well-defined path that integrates the conservation of both natural and cultural heritage with sustainable economic development. Through a holistic approach involving all territorial actors, it is possible to ensure that the Madonie not only preserve their unique identity but also become a model of sustainable development for other rural and mountainous areas.

The proposed methodology for the development of a *smart village* is divided into several strategic phases. Initially, a SWOT analysis is conducted to assess the small centres, identifying strengths, weaknesses, opportunities, and threats of the territorial context. Next, direct contact with the territory is established through a series of reconnaissance visits and photographic

campaigns, useful for deepening the understanding of local specificities. This is followed by the identification of key sectors, that is, the most developed productive sectors, as well as relevant services and territorial *governance*. The planning of architectural rehabilitationand energy efficiency interventions follows, with the aim of improving quality of life and ensuring high sustainability standards. A fundamental part of the process is the evaluation of genius loci and territorial vocation, which guide rehabilitationand enhancement strategies.

The work plan provides a dual approach: on one hand, specific interventions for the selected village; on the other, an overall vision for the entire territorial area, to standardise the territory according to innovation and sustainability criteria, but most importantly, compatibility. Finally, a set of guidelines is proposed that integrates tradition and innovation, with a strategic atlas that describes the policies and specific smart solutions that can be applied.

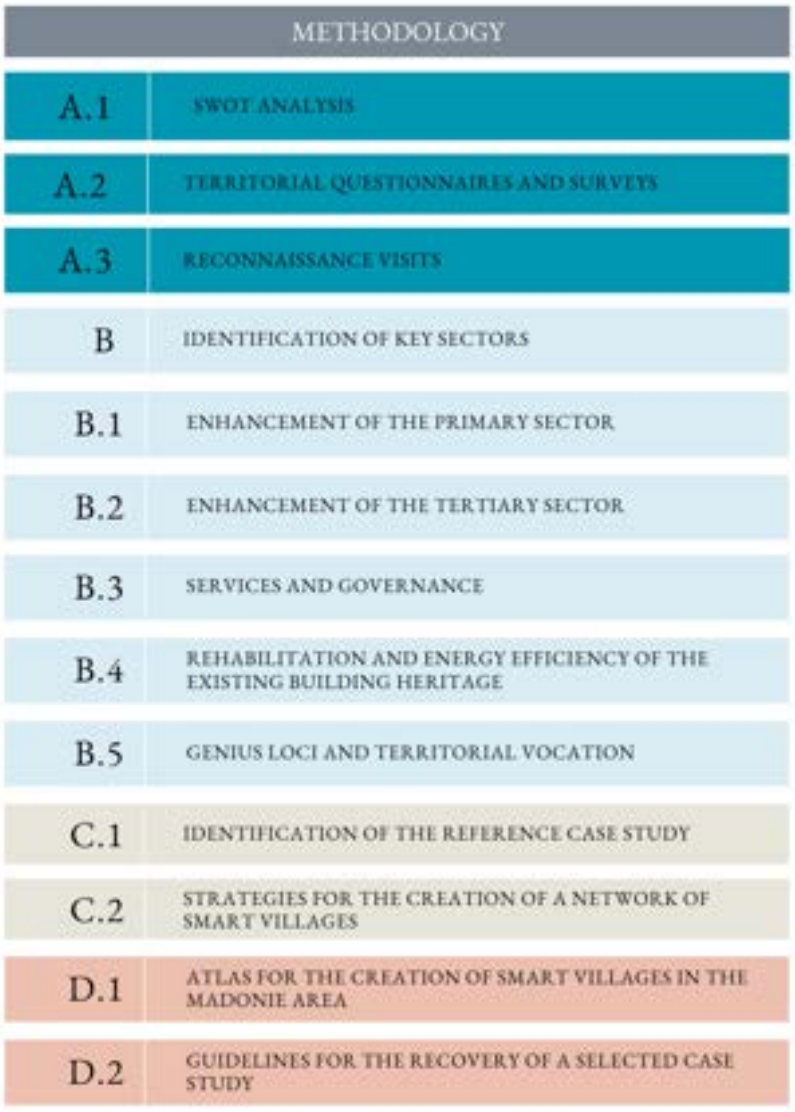


Fig. II.3.1 | Methodology for identifying the outputs of the Research ©Luisa Lombardo, 2024.

II.3.1 The municipality of Polizzi Generosa

The selection of Polizzi Generosa as a case study fits, as already mentioned, within a context of in-depth collaboration with the Superintendence for Cultural and Environmental Heritage of Palermo, a key entity in the preservation and enhancement of Sicilian historical, artistic, and cultural heritage. The partnership with this institution played a crucial role in choosing Polizzi Generosa as a case study. The collaboration allowed for a deeper understanding of the area, significantly enriching the analysis of the case study.

Polizzi Generosa is a municipality of great historical and cultural interest, the result of centuries of evolution and stratifications (Salamone, 1987). Its historic centre, partially well-preserved, is an authentic example of a medieval village, with winding streets, stone houses, and finely decorated portals. Among the main monuments are the majestic mother church, the Capuchin convent, the grand baronial palace, and the characteristic Politeama theatre. The history of Polizzi Generosa is a journey through the civilisations that have passed through it, from the Sicani to the Romans, from the Arabs to the Swabians, from the Angevins to the Aragonese, and finally the Bourbons. In the 16th century, the municipality became a fief of the influential Moncada, Branciforti, and Filangieri families, demonstrating the strategic and cultural importance of the area (Salamone, 1987).

The connection between Polizzi Generosa and its local identity is a central element in the analysis. The municipality is strongly committed to the preservation and promotion of its cultural heritage, with particular attention to the surrounding environment and the enhancement of cultural, naturalistic, and tourist activities. The collaboration with the Superintendence allowed for a deeper understanding of how the community preserves and enhances its cultural and environmental heritage.

Located in the Upper Madonie, about 80 km north-west of Palermo, Polizzi Generosa is an ultra-peripheral area, as defined in the SNAI strategy. The municipality's road network, although not crossed by highways, includes state, provincial, and municipal roads that provide medium-low connectivity, but are sufficiently effective to support gradual economic and social development. The SS120, the "Road of the Four Sicilian Parks", connects Polizzi Generosa to Palermo and Catania and is one of the municipality's key junctions. Among the provincial roads, the SP118 facilitates the interchange with Castellana Sicula, while the SP119 is crucial for mountain tourism, connecting the municipality to the Mufara peak, home to the ski resort of Piano Battaglia (Anselmo, 2016).

The consultation of practices and projects, and the assessment of the issues identified by the Superintendence, as well as the administration of documentation on protected monumental assets, provided a crucial contribution in understanding potential dynamics to undertake in collaboration.

Polizzi Generosa has a millennia-old history, marked by the settlement of various populations that have left indelible traces on the territory (Albanese, 2018). Its status as a state-owned city attracted numerous noble families who, over the centuries, enriched the urban and cultural heritage of the village. Despite its small size, it preserves an extraordinary artistic heritage, with churches, palaces, and museums that tell its history. Once, over 72 churches enriched its urban fabric. The urban fabric has retained its original structure, with alleys and streets that transport the visitor into the past, enriching the experience of those who explore it (Macaluso, 2022).

The municipality also boasts a rich variety of natural resources, which play a crucial role in its identity and territorial development. Water, coming from numerous springs, is essential for water supply and agricultural irrigation, supporting local agriculture and preserving the traditional rural landscape. The surrounding forests, rich in oaks, chestnuts, and beeches, provide firewood and non-timber forest products, contributing to the local economy and environmental protection. The mineral deposits of limestone, clay, and gypsum support the construction industry, while the wildlife, including wild boars and deer, sustains the hunting tradition and nature

tourism (Gennuso, 2019). The mountain landscape, with its breathtaking views, is a growing tourist resource for hiking and outdoor activities. Sectors such as tourism, agriculture, livestock, and crafts, closely linked to local tradition, contribute to the economy and the enhancement of cultural identity.

The choice of Polizzi Generosa as a case study is strengthened by its geographical location, situated in the Upper Madonie for its inaccessibility due to the orography, and by its commitment to urban regeneration and heritage conservation, making it one of the most virtuous municipalities in the area, as indeed defined in Chapter I, one of the four Madonie municipalities to have funded a project under the PNRR (Macaluso, 2022). The enhancement project is also supported by the agreement with the Department of Architecture at the University of Palermo, which has created the ideal conditions for a degree workshop dedicated to the protection and enhancement of the village. Furthermore, the Department, particularly the CEAR-08/A sector, is a key partner in the PNRR project.

The history of Polizzi Generosa is a subject of debate among scholars (Lavanco, 2019). Some suggest that the name may derive from the city of Polis, others link it to the gods Palici. The hypothesis that the name derives from "Polis Isidis," or City of Isis, is supported by the discovery of a statue of Isis. The city has Byzantine origins, was later conquered by the Saracens and then the Normans, who initiated a period of prosperity. Its subsequent belonging to the Normans, Swabians, Angevins, and Aragonese left deep traces in the historical and artistic heritage, making Polizzi Generosa a unique example of cultural continuity over the centuries (Curatolo, 2019).

The PNRR project entitled "G.A. Borgese Genius Loci. Discovering the Territory and Traditions" aims at the regeneration of Polizzi Generosa through the enhancement of cultural and natural heritage. With a total budget of 20 million euros, of which 17.5 million funded by the PNRR and 2.5 million by the municipality, it includes the redevelopment of historical-architectural heritage, the development of new cultural and tourist activities, and the relaunch of local productive activities.

The analysis of practices adopted by the municipality highlighted both the positive aspects and the critical issues, with particular attention to the lively organisation of events throughout the year, which has contributed to making Polizzi Generosa, today, an important tourist attraction thanks to its tradition and the historical-artistic value of the area. The municipality has also successfully participated in projects such as the Italian Environmental Fund's "I luoghi del cuore" and the "Borghi dei Tesori" project, aimed at the rehabilitationand enhancement of monumental architectural heritage (Anselmo, 2021).

To deepen the understanding of Polizzi Generosa, photographic campaigns and analyses of construction traditions and built heritage were conducted, involving local inhabitants to better understand their needs and requirements.

The focus was placed on cataloguing the territorial peculiarities, with the aim of making the data easily understandable and systematisable. The following sheets include a detailed overview of the territory, analysis of data from the ISTAT website, geographical and climatic conditions, road network, natural resources, architectural assets catalogued by the Superintendence, the PNRR project, and finally, a partial SWOT analysis, summarising the main issues and opportunities of the area. This approach has allowed for a clear and organised vision of the resources and strengths, facilitating effective planning for the sustainable development of the municipality.

Fig. II.3.1.1 | Giuseppe Garibali Avenue, Polizzi Generosa ©Polizzi Generosa: un ecomuseo da vivere e scoprire, 2023.

Fig. II.3.1.2 | "Maretta" in Polizzi Generosa ©Luigi Parisi, 2023.

TERRITORIAL FRAMEWORK

Polizzi Generosa is a municipality located in the heart of the Madonie, a mountainous area in north-western Sicily, in the province of Palermo. It is located at an altitude of approximately 917 meters above sea level, which gives it a picturesque panorama and a dominant position over the northern Imera valley.

Geographically, it is located within the Madonie Park, a nature reserve of great environmental value, characterized by exceptional biodiversity and landscapes rich in unique flora and fauna.

Fig. II.3.1.3 | Polizzi Generosa from the satellite ©Google Maps, 2024.

Fig. II.3.1.4 | Polizzi Generosa from the drone ©Carmelo Di Salvo, 2021.

Fig. II.3.1.5 | Planimetria di Polizzi Generosa ©Luisa Lombardo, 2023

CITIZENS

2.913 (31 december 2022)

ALTITUDE

920 m above sea level
minimum: 362
maximum: 1,869

COORDINATE GEOGRAFICHE

Sexagesimal system
37° 48′ 46.44″ N
14° 0′ 15.12″ E

Decimal system
37.8129° N
14.0042° E

GEOGRAPHICAL COORDINATES

Seismic Zone 2

Area where strong earthquakes may occur.

CLIMATIC CLASSIFICATION OF MARCIANA

Heating system activation period:
from 1st November to 15th April (12 hours daily), unless extended by the Mayor.

Degree-days: 2,037

The degree-day (DD) of a location is the unit of measurement that estimates the energy requirement needed to maintain a comfortable climate in homes. It represents the sum, extended to all the days of a conventional annual heating period, of the daily average temperature increments required to reach the 20°C threshold. The higher the DD value, the greater the need to keep the heating system on.

TEMPERATURES

The temperature generally ranges from 5°C to 28°C and is rarely below 2°C or above 31°C.

DEMOGRAPHIC DATA

Total population, population density	Approximately 2,913 inhabitants (2022); Density: 21 people/km^2
Average age, age distribution	High average age; majority of the population is elderly, with a growing decline in the number of young people.
Migration trends	Emigration higher than immigration, negative migratory balance
Birth and mortality rate	Low birth rate (21 births, 56 deaths in 2022)

LOCAL ECONOMY

Predominant economic sectors	Agriculture, livestock farming, tourism, mining industry
Employment and unemployment	Unemployment on the rise, with reduced opportunities for young people
Presence of local businesses and start-ups	Small artisan businesses, agritourisms; shortage of start-ups
Innovation and digitalisation initiatives	Initial attempts at digitalisation and innovation in agriculture and tourism

INFRASTRUCTURES AND TRANSPORT

Road and rail accessibility	Well-connected road network, absence of direct railways; access via provincial and state roads
Infrastructure conditions	Provincial roads in good condition; maintenance required for some local arteries
Public and private transport network	Limited; most transportation is private
Digital connections	Broadband available (fibre and wireless), connections are being improved

SERVIZI PUBBLICI E SOCIALI

Health facilities, schools	Limited healthcare facilities; presence of primary and secondary schools
Services for seniors and young people	Care and recreational centers for the elderly; lack of advanced services for young people
Public safety and civil protection	Medium-high security level; Well organized civil protection

CULTURAL AND HISTORICAL HERITAGE

Monuments, museums, local traditions	Rich in monumental heritage and traditions, religious festivals and festivals
Cultural and recreational events	Cultural festivals and local festivals
Enhancement of heritage	Growing attention towards the rehabilitationof artistic and historical heritage, especially for the redevelopment of buildings

TOURISM AND LEISURE

Tourist offer	Cultural, naturalistic, food and wine tourism (Verbumcaudo)
Accommodation facilities	Farmhouses, B&Bs, hotels, farms and numerous facilities for nature tourism
Recreational activities	Trekking, hiking, naturalistic activities

ENVIRONMENTAL SUSTAINABILITY

Natural resource management	Modest water management; low quantity of projects to enhance forestry and mineral resources
Environmental policies	Environmental protection policies in collaboration with the Madonie Park
Presence of natural parks	Part of the Madonie Park and several protected areas in Protection 1 and 2

SOCIAL STRUCTURE AND PARTICIPATION

NGOs and voluntary associations	Active participation of local associations in social and cultural projects
Citizen participation	Limited involvement of citizens in local decisions through assemblies
Social cohesion	Modest level of social cohesion and community identity

TECHNOLOGICAL INNOVATION

Smart city initiatives	Initial smart lighting projects and excellent waste management (AMA Waste is Resource)
Presence of *IoT* technologies	Very limited applications; few projects in development
Sustainable development projects	Projects to improve energy efficiency with PNRR funds (Vicolo Cilluffo)

DEVELOPMENT AND GOVERNANCE POLICIES

Local public policies	Tourism and agricultural development programs; plans to improve road infrastructure
Availability of funds	Some European funding for architectural restoration projects and sustainable development (e.g., PNRR)
Public-private collaborations	Collaborations with local entities (So.Svi.Ma), universities, regional authorities, and good synergy with the Madonie Park

Fig. II.3.1.6 | The phenomenon of "maretta" in Polizzi Generosa ©Luisa Lombardo, 2023.

TERRITORIAL AND LOCAL ACCESSIBILITY

State Roads	**SS120** - State Road 120 (Etna and Madonie) [Palermo, Catania] Connection to the main Sicilian cities, supporting tourist flows and access to local resources.
Provincial Roads	**SP118** - [Polizzi Generosa, Castellana Sicula] Strengthens connectivity and economic and social exchange **SP119** - [Polizzi Generosa, Piano Battaglia] Promotes ski and nature tourism **SP120** - [Polizzi Generosa, Petralia Soprana] Supports commercial and cultural exchanges **SP121** - [Polizzi Generosa, Gangi] Strengthens territorial and cultural cooperation
Municipal Roads	**SC1** - [Polizzi Generosa, Piano Pomo] Access to natural and agricultural areas **SC2** - [Polizzi Generosa, San Giovanni] Promotes local economic development **SC3** - [Polizzi Generosa, Portella del Vento] Reduces isolation of the more distant villages

NATURAL RESOURCES

Water	Numerous water springs, including that of the Pollina River
Forests	Madonie Park and rich Mediterranean variety; Oak, chestnut, and beech forests
Mineral resources	Limestone, clay, and gypsum deposits
Wildlife	Wild boars, deer, foxes, rabbits
Mountain landscape	Protected (UNESCO Global Geopark) and rich in hiking trails
Agriculture	Cultivation of typical products, supported by abundant water resources and fertile soil
Animal husbandry	Practiced with traditional methods
Craftsmanship	Wood, iron, and ceramic craftsmanship

Fig. II.3.1.7 | Arches of the ancient Roman-style Aqueduct of 1817 in Polizzi Generosa ©Carmelo Di Salvo, 2023.

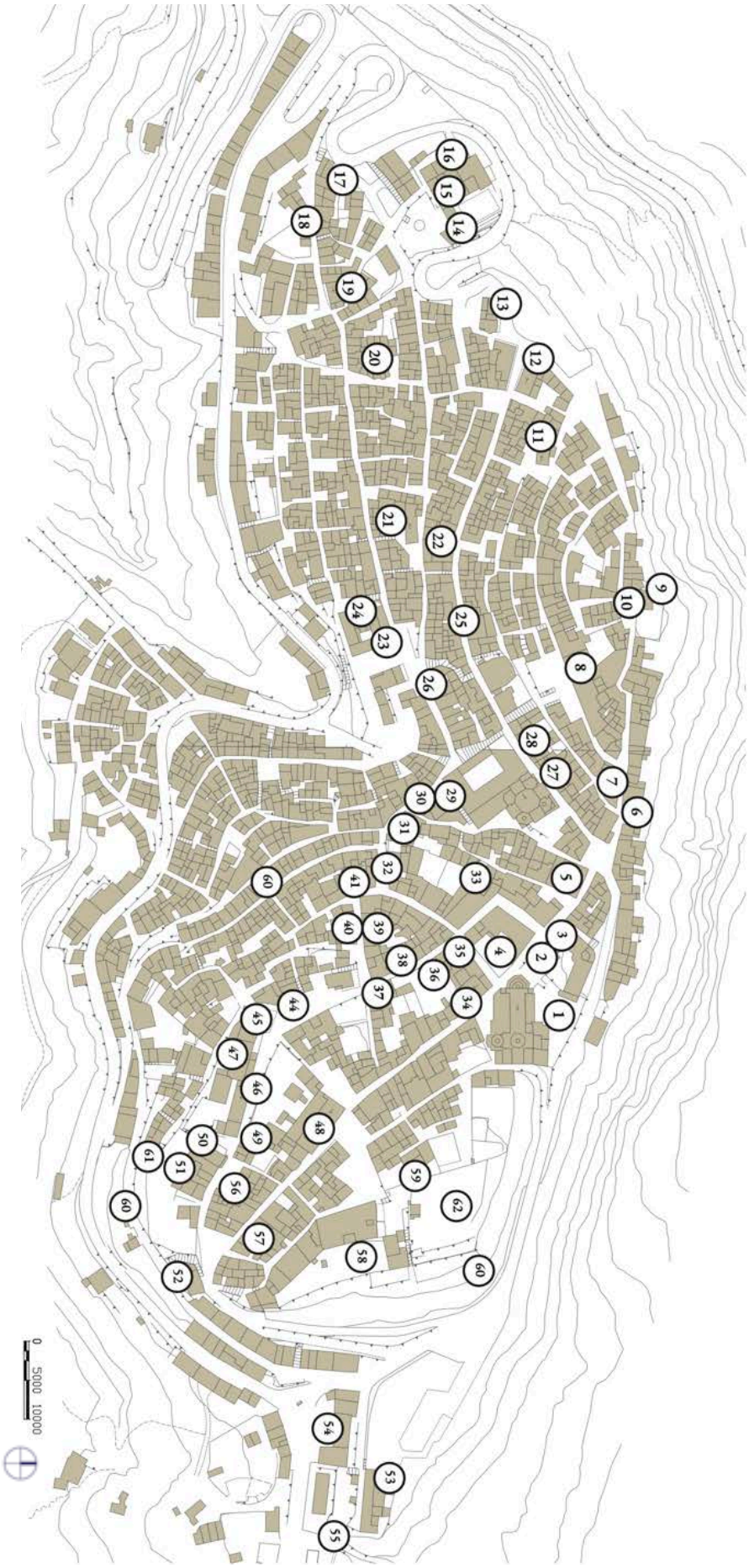


Fig. II.3.1.8 | Source: Register of assets cataloged by the Superintendence of Cultural Heritage of the Province of Palermo.

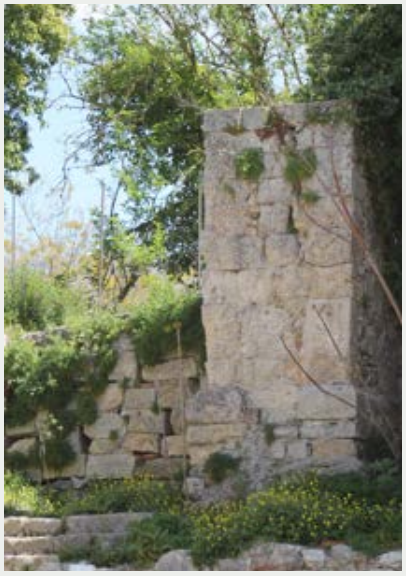


Fig. II.3.1.9 | Ruins of the Castle of Polizzi Generosa ©Luisa Lombardo, 2023.

Fig. II.3.1.10 | Church of the Carmine in Polizzi Generosa ©Luisa Lombardo, 2023.

LIST OF ASSETS REGISTERED BY THE SUPERINTENDENCE OF CULTURAL HERITAGE OF THE PROVINCE OF PALERMO

1. Chiesa Madre (Beata Vergine Assunta), 1690 (sui precedenti impianti minori del 1083; portico laterale del 1486-1521, portale del 1700)
2. Chiesa della SS. Trinità (già Chiesa madre) dall'ordine dei religiosi cavalieri di S. Maria dei Teutoni, 1303
3. Ex Ospedale della SS. Trinità (poi della SS. Annunziata), 1400 (su precedente impianto del sex XIV o precedente; dal 1591 al 1866 Ospedale dei Frati Fatebenefratelli di S. Giovanni di Dio; demolito)
4. Palazzo La Farina (poi Gugliano - Porcara), sec. XVI
5. Palazzo Rampolla - Caracciolo sec. XVIII (resti di facciata e delle strutture murarie interne)
6. Ex Chiesa della Madonna dell'Odigitria 1589 (chiusa al celto nel 1892, oggi inglobata in costruzioni recenti)
7. Palazzo Sponselli, sec. XVII (resti)
8. Palazzo Gagliardi Barone di Carpinello della Regia Secrezia, sec. XVII
9. Chiesa di S. Pancrazio, 1570, fu capo di capitaneria centro spirituale dei Bizantini sino a tutto il sec. XVI. Non è databile, ma probabilmente è anteriore all'occupazione Araba (ampliamenti del 1611; oggi abbandonata)
10. Torre, sec. XVI (su precedente impianto)
11. Chiesa di S. Giorgio chiamata dal '700 dell'Udienza. Fu capo di capitaneria, sec XVII (su precedente impianto: rito greco)
12. Chiesa di S. Maria Lo Piano (o di Gesù o del Soccorso) esistente prima del 1301 (rimaneggiamenti del sec. XVIII e successivi)
13. Chiesa della SS. Trinità dell'Ordine dei Religiosi Cavalieri di S. Maria dei Teutoni, 1303 (sconsacrata, oggi garage)
14. Oratorio del SS. Rosario, 1555 (parzialmente demolita)
15. Chiesa di S. Spirito, inizi del sec. XV (parzialmente crollata), annessa al convento dei Domenicani e oratorio della Madonna del Rosario. Il convento fu costruito nel 1496 accanto alla chiesa che già esisteca; l'oratorio è del 1555
16. Convento dei PP. Domenicani, 1469-1549 (dismesso, manomissioni e trasformazioni d'uso recenti)
17. Ex Chiesa del SS. Salvatore, 1554 (rudere del sec. XIX sostituita da edilizia abitativa del sec. XX)
18. Ex Chiesa di S. Biagio, sec. XIII (demolita nel 1838)
19. Chiesa di S. Antonio Apostolo, 1361 (su precedente impianto arabo; trasformazioni del sec. XVII)
20. Chiesa di S. Maria degli Schiavi (o della Porta), 1672 (su precedente impanto)
21. Chiesa di S. Orsola 1570 (sul precedenre impianto minore della chiesa di S. Maria di Presti Michele del 1386)
22. Palazzo Signorile, 1885 (su precedente impianto)
23. Chiesa di Maria di Gesù (o di S. Maria degli Angeli, 1661)
24. Ex convento dei Frati Minori Osservanti, 1661 (dismesso; dal 1913 Ospedale civico, demolito e ricostruito)
25. Convento di S. Giovanni Apostolo, (dismesso, oggi esercizio commerciale)
26. Palazzo Porcaro, sec. XVIII
27. Chiesa di S. Girolamo, 1681-1730 (col titolo di San Domenico dal 1767 al 1805)
28. Collegio dei PP. Gesuiti, 1681-1730 (dal 1767 al 1805 dei PP, Domenicani, dal 1805 al 1866 ancora dei PP. Gesuiti; oggi Municipio)
29. Chiesa di S. Caterina, 1750
30. Orfanotrio di S. Caterina (o Badia Piccola), inizi del sec. XVII (dismesso nel 1786)
31. Palazzo signorile, sec, XVIII
32. Palazzo Porcaro, sec, XIX
33. Palazzo signorile, sec. XVIII

Fig. II.3.1.11 | Church of Santa Maria Gesù Lo Piano in Polizzi Generosa ©Luisa Lombardo, 2023.

Fig. II.3.1.12 | Church of Saint Ursula in Polizzi Generosa ©Luisa Lombardo, 2023.

Fig. II.3.1.13 | Mansion Palace ©Luisa Lombardo, 2023.

34. Chiesa di S. Gandolfo (detta La Povera), 1622 (sui precedenti impianti della Chiesa e dell'Ospedale di S, Cecilia esistenti nel 1386)
35. Collegio di Maria, 1786 (sul precedente impianto della "Casa del Vescovo" del sec, XVII-XVIII; dal 1913 diretto dalle Suore Missionarie Francescane del Bambino Gesù)
36. Resti di balcone, sec. XV
37. Resti di portale, sec, XVIII
38. Chiesa di S. Maria delle Grazie, fine del sec, XV (rimaneggiamenti del 1793)
39. Monastero delle suore Benedettine di S. Maria delle Grazie (detto Badia Grande), 1499 (sui precedenti impianti della Chiesa di S, Mattéa e del Palazzo Signorino)
40. Palazzo signorile, sec. XVIII (resti)
41. Resti di Portale, sec. XVI
42. Ex Chiesa di S. Maria Maddalena, 1315-1386 (dal 1558 aggiunto il titolo di S, Giovanni Battista; demolita nel 1892 per la costruzione della carrozzabile Collesano-Polizzi)
43. Chiesa di S. Agostino (già S Giovanni B,del Ponte), sec. XIII (dal 1580 Commenda della Camera Magistrale del Priorato di Messina dei Cav. di Malta, dismessa nel 1866, rudere)
44. Palazzo Fatta, sec. XVIII
45. Chiesa di S. Nicolò dei Franchi, 1167 (rimaneggiamenti del sec. XVI; già annessi Ospedale e Ospizio omonimi, poi inglobati nel Monastero di S, Margherita)
46. Chiesa di S. Margherita, sec, XVII (su precedente impianto)
47. Ex Monastero di S. Margherita delle Suore Benedettine, 1323-1327 (demolito e sostituito da edilizia del sec, XX)
48. Chiesa di S. Francesco d'Assisi, sec, XIV (restauri recenti)
49. Convento dei Frati minori Conventuali di S. Francesco, sec. XIV (dismesso nel 1860)
50. Chiesa di Maria SS. Annunziata, sec. XV (in rovina)
51. Ex Convento dei FF. Minori Cappuccini, 1644 (dismesso nel 1866, demolito e sostituito da edilizia abitativa del sec, XX)
52. Ex Chiesa della Madonna delle Grazie, inizi del sec, XVI (ricostruita nel 1618; demolita nel sec. XX)
53. Chiesa della Madonna della Misericordia (poi della Madonna del Carmelo), sec. XV (rimaneggiamenti dei secc, successivi)
54. Ospedale di S. Giuliano e Convento dei PP. Domenicani, 1420 (dal 1549 dei PP, Carmelitani Riformati di Monte Santo; demolizioni parziali e rifacimenti del sec, XX)
55. Acquedotto, 1476-1480 (resti)
56. Ex Chiesa (demolita)
57. Palazzo Maretta Barone di S. Agata (poi Migliozzi Dagnino), sec. XVIII (su precedente impianto)
58. Palazzo Gagliardo di Casalpietro, sec, XVII
59. Ex Chiesa della Madonna del Castello (chiusa al culto nel 1897; sconsacrata nel 1918, oggi ruderi)
60. Mura di Città, sec, VII-XI (rimaneggiamenti del sec. XIV)
61. Ex Porta Grande (demolita)
62. Castello di Ruggero, sec. XII (resti delle torri quadrangolari e della cortina muraria perimetrale)

EVENTS AND HISTORICAL NOTES

Ancient Origins	Various hypotheses about its origins: it could correspond to Sicilian Athens, the survivors of Palica, or derive from "Polis Isidis" (City of Isis).
Byzantine Domination	The city was fortified by the Byzantines to defend against the Arabs. The fortress stood in a strategic position on the rocky outcrop.
Saracen Conquest	In 882, the Saracens defeated the Byzantines and transformed a mosque into what is now the Church of Saint Anthony the Abbot.
Norman Domination	Roger I fortified the castle, and Polizzi Generosa became an important center under Norman rule.
Period of Adelasio (1082)	Count Roger granted Polizzi to his niece Adelasio, who expanded the town and promoted the coexistence of groups: Byzantines, Arabs, Latins, nd Jews.
Granting of the Title "Generosa" (1234)	Frederick II granted the title of "Generosa" to the city for the privileges and prosperity of the territory.
Feudal Conflicts (14th century)	P.G. was contested between the Chiaramonte and Ventimiglia families. The Ventimiglia gained control and reinstated it into the royal domain.
Loss of Independence	The city lost its independence with the arrival of Martin the Younger, being forced to sell territories to pay off debts. It regained its autonomy in 1445.
Renaissance	A period of great artistic and cultural splendor. Polizzi was a central crossroads and benefited from privileges related to its geographical location.
Post-Renaissance Decline	The epidemics of the 16th century and conflicts led to a slow decline of the town, although there was an economic rehabilitationin the 19th century.
20th Century Innovations	In 1901, Polizzi Generosa introduced electricity using a local water mill, a sign of the industriousness and innovation of its inhabitants.

Fig. II.3.1.14 | Through the streets of Polizzi Generosa ©Luisa Lombardo, 2023 (photo on the left).

Fig. II.3.1.15 | A "tocco" in Polizzi Generosa ©Luisa Lombardo, 2023 (photo on the right).

Fig. II.3.1.16 | Mother Church at night ©Carmelo Di Salvo, 2023 (photo on the left).

Fig. II.3.1.17 | Basic architecture in Polizzi Generosa ©Luisa Lombardo, 2023 (photo on the right).

Fig. II.3.1.18 | Polizzi Generosa and the Palazzo della Cultura from a drone ©Luisa Lombardo, 2023 (photo at the bottom).

"*Up there in the Madonie, which is the name of the Sicilian Apennines, where I have yet to return, the town of my early years has its place. Amidst the grand scenery—oleanders lining the classical valley, olive trees cascading from slope to slope, bright peaks descending in orderly ranks from the central acropolises to the sea, and finally the sea of the Imera, sliced like a wedge behind the last backdrop—no other city or village is visible. Polizzi Generosa, draped in its superb epithet, towers alone*". G.A. Borgese

GIUSEPPE ANTONIO BORGESE

Giuseppe Antonio Borgese was born in Polizzi Generosa on November 12, 1882. After completing his high school studies in Palermo under the guidance of Umberto Amico, he moved to Florence in 1900, where he studied at the Institute of Higher Studies, attending figures like Vitelli and Villari. He contributed to several journals, including La Scintilla and L'Archivio per lo studio delle tradizioni popolari. The intellectual fervor of Florence led him to join Giovanni Papini's circle and write for Il Leonardo, developing a literary criticism based on Catholic nationalism, far removed from violence. During this time, he met and married Maria Freschi, with whom he had two children, Leonardo and Giovanna.
Borgese established himself as a prominent writer and literary critic. His early works, including Parola e immagine (1903) and Metodo storico e critica estetica (1903), highlight an interest in poetic unity and literary criticism. Among his most important works is Rubè (1921), a novel addressing the inner conflict of modern man. During the 1930s, he emigrated to the United States, fleeing fascism and dedicating himself to the intellectual struggle against totalitarian regimes. He contributed to the drafting of a project for a world constitution and continued publishing essays until his death in 1952.

PNRR

"*G.A. Borgese, Genius Loci: Discovering the Territory and Traditions. Culture and Beauty as Tools for Cultural and Social Regeneration and the Enhancement of Public Heritage. Initiatives Aimed at Increasing the Village's Attractiveness.*" it is the name of the project presented by the Municipality of Polizzi Generosa.

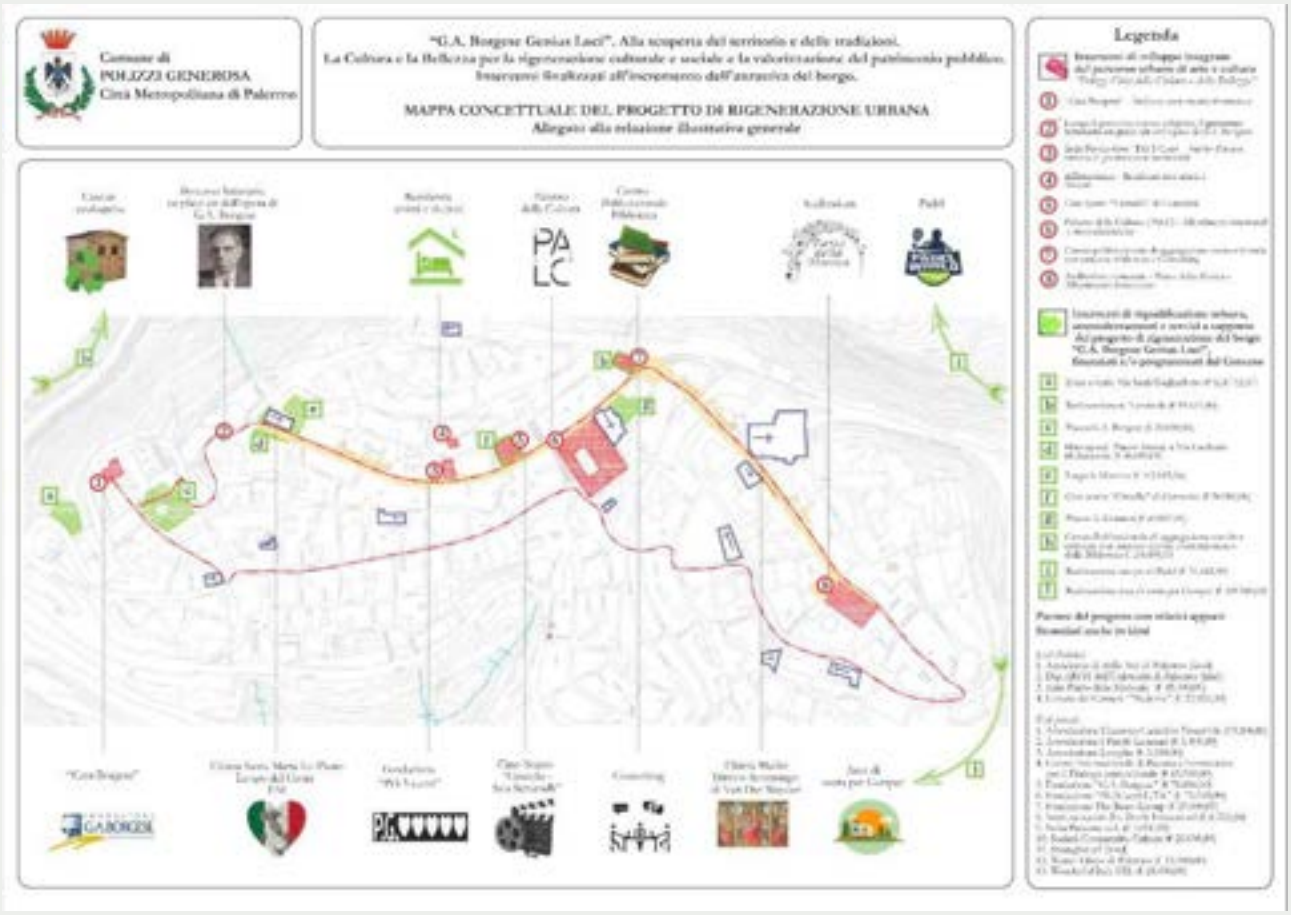


Fig. II.3.1.19 | Project funded by the PNRR in Polizzi Generosa ©Municipality of Polizzi Generosa, 2023.

PNRR PROJECT

The project aims to enhance the potential of the area and revitalize its identity sectors through innovative technological interventions, with positive impacts on the socioeconomic fabric. The Literary Park dedicated to G.A. Borgese, established in 1996 as part of the Global Grant Literary Parks, is a central component. This park promotes culture through literary paths inspired by Borgese's writings and the environmental reconstruction of the town.

The project's objectives include:
- **Cultural heritage enhancement:** Through technological interventions to modernize and improve the accessibility of key historical and artistic sites.
- **Increase in tourism demand:** Engaging visitors during off-season periods and enhancing the attractiveness of the village.
- **Organization of recurring events:** Music, art, and philosophy festivals will be scheduled to increase tourist flow and visitor stay.
- **Accessibility to historical and cultural heritage:** Targeted interventions to improve physical and cognitive accessibility, promoting sustainable tourism.
- **Cultural responsibility:** The enhancement of cultural heritage aims to encourage the active participation of the community in the regeneration of the village.

Planned macro-actions
The project's actions will be carried out through the redevelopment of various "cultural containers," including:
- **Palazzo della Cultura and Auditorium:** Targeted interventions to improve the spaces and adapt them for exhibitions and concerts.
- **Casa Borgese:** It will house an immersive museum dedicated to the author, with multimedia paths and traditional cooking workshops.
- **Cine-Theater "Cristallo":** Made accessible with modern technologies, including devices for people with sensory disabilities.

Furthermore, the project includes the involvement of partners, such as the Department of Architecture at the University of Palermo, to support the development of a widespread socio-cultural hub aimed at enhancing local beauty and culture. An "en plein air" urban route will connect the different cultural containers, integrating into the historic fabric of the village.

Development of the urban art and culture path
- **Immersive Museum of Casa Borgese:** An interactive museum that tells the life and work of Borgese, with workshops dedicated to promoting local products.
- **"PG5Cuori" Foundation:** A cultural workshop promoted by fashion designer Domenico Dolce, dedicated to territorial promotion and the organization of cultural events.
- **Artist Residence:** Redevelopment of an abandoned municipal building to transform it into an artist residence, increasing the cultural appeal of the village.
- **Cine-Theater Cristallo:** Recently redeveloped, the theater will offer screenings and performances adapted for people with sensory disabilities, contributing to the inclusive enjoyment of cultural heritage.
- **Palazzo della Cultura:** An exhibition center for art and technological innovation, serving as the focal point of urban regeneration.
- **Multipurpose Center:** A modern library and coworking spaces for the dissemination of culture and legality, aimed at further involving citizens.
- **Municipal Auditorium:** Renovated to become a Park of Music, it will be the heart of the village's artistic and musical production.

Urban redevelopment interventions
Urban redevelopment works and supporting infrastructure for the project will also be carried out, including:
- **Piazza G.A. Borgese:** Starting point for outdoor itineraries.
- **Square next to the FAI "Luogo del Cuore" site:** Redevelopment of the area next to the Church of Santa Maria Gesù Lo Piano.

Finally, eco-islands, a padel court, and a camper parking area will be created near the urban park dedicated to Falcone and Borsellino. These interventions contribute to strengthening the tourist and cultural appeal of the village, improving the quality of life for the local community.

SWOT ANALYSIS

The SWOT analysis allows for the identification of strengths, weaknesses, opportunities, and threats of the Municipality of Polizzi Generosa, highlighting the key aspects for the intelligent and sustainable development of the territory.

Strengths:

- **Cultural and historical heritage:** Polizzi Generosa boasts a rich cultural and historical heritage, with significant monuments, churches, museums, and local traditions dating back to ancient times, including Byzantine and Norman legacies.
- **Strategic geographic location:** The municipality enjoys a position that makes it an important crossroads for nature and cultural tourism.
- **Biodiversity and natural wealth:** The presence of natural parks and protected areas, along with a mindful management of natural resources, makes Polizzi a reference point for eco-tourism.
- **Diverse tourism offerings:** The municipality has numerous accommodations (hotels, B&Bs, agritourisms) and recreational activities that foster a steady flow of tourism.
- **Moderately active and cohesive community:** Citizen participation in local decisions and strong social cohesion, supported by volunteer associations and cultural initiatives.
- **Title of "Generosa":** The historical recognition of being a "demanial" city offers prestige and a culturally significant image.

Weaknesses:

- **Demographic decline:** Polizzi suffers from a negative migration trend, with progressive depopulation and a high average age, limiting the development of economic initiatives.
- **Limited technological infrastructure:** Despite some progress, broadband and fiber optic coverage is limited, hindering digital development and innovation.
- **Difficulties in public transportation:** Road accessibility is poor, rail connections are absent, bus services are sporadic, and public transportation links are insufficient, making it difficult to travel to larger centers.
- **Weak economic sector:** The local economy is primarily based on agriculture and tourism, but it lacks diversification and technological innovation in both the production sectors and the tertiary sector, as well as in industry.
- **Low capacity to attract young entrepreneurs:** The lack of opportunities and services limits the municipality's ability to retain and attract young talent, both local and external.

Opportunities:

- **European funds:** The opportunity to access funding and grants for sustainable development, technological innovation, and the enhancement of cultural and natural heritage.
- **Sustainable tourism development:** Expanding the tourism offer related to nature, food and wine tourism, and experiential tourism could attract new visitors and support the local economy.
- **Smart city initiatives:** The growth of smart city projects, with innovative solutions for managing lighting, waste, and mobility, could improve the quality of life and promote sustainability.
- **Public-private collaborations:** Strengthening partnerships with public and private entities to enhance local resources and improve infrastructure.
- **Rehabilitation:** The potential to rehabilitate and make basic infrastructure more efficient.

Threats:

- **Continuous depopulation:** If not addressed, the population decline could further undermine the economic and social sustainability of the municipality.
- **Climate change:** Environmental issues related to climate change could damage natural resources, affecting sectors such as agriculture and tourism.
- **Tourism competition:** Competition with other regional tourist destinations could make it more difficult to attract visitors, especially if there is no investment in territorial marketing.
- **Global economic difficulties:** Economic crises at the national or international level could reduce available funds for local development and limit investments in the municipality.

SWOT TABLE

Strengths	- Rich cultural, historical, and architectural heritage; - Strategic location in the Madonie; - Biodiversity and natural parks; - Diverse tourism offerings; - Active and cohesive community; - Historical recognition as the "Generosa" city.
Weaknesses	- Demographic decline and depopulation; - Limited technological infrastructure; - Inadequate public transportation; - Undiversified local economy; - Difficulty in attracting young entrepreneurs.
Opportunities	- Access to European funds; - Development of sustainable tourism; - Implementation of smart solutions to create *Smart Villages*; - Public-private partnerships.
Threats	- Depopulation; - Impacts of climate change; - Competition with other countries; - Economic crises limiting funding.

Fig. II.3.1.20 | Polizzi from a Bell Tower ©Luisa Lombardo, 2024.

II.3.2 Smart protection of the Madonie areas. Enhancement tools

In light of the company internship provided by the INPS scholarship, in collaboration with the company tutor Arch. Delia Geraci from the Superintendence for Cultural and Environmental Heritage of the Province of Palermo, the in-depth study of the Madonie area was conducted following the pre-agreed programme and in synergy with the Polytechnic University of Valencia and the Royal Academy of Fine Arts of San Carlos in Valencia. In particular, the following areas were addressed:

- **analysis of Spanish urban contexts**: in order to compare similarities and differences with the Madonie area, aiming to identify *best practices* and innovative strategies applicable to the Madonie context;
- **study of strategies for the energy efficiency of existing building heritage:** with the adoption of sustainable, technological solutions compatible with the built heritage. Particular attention was paid to alternative solutions to traditional technological devices, such as micro-invasive photovoltaic systems, photovoltaic tiles, solar tiles, balcony photovoltaics, balustrades, railings, and photovoltaic parapets, as well as the use of solar globes, wind towers, solar chimneys, domestic wind power, and mini wind turbines. The aim was to energetically redevelop the residential heritage with low environmental impact interventions;
- **analysis of interventions compatible with the built environment:** focusing on improving accessibility in mountain villages and the development of digitalisation in rural contexts. Solutions for fibre optic cabling and the implementation of digital systems were proposed, with the intent to make the Madonie villages more accessible to tourists and vulnerable users;
- **examination of tools to support designers for the rehabilitation of architecture and the enhancement of historic centres:** with particular attention to regulatory and technical solutions for interventions compatible with the historical-cultural heritage.

The integrated approach has allowed the development of targeted strategies for the enhancement and regeneration of the Madonie area, promoting innovative, sustainable solutions that are compatible with the historical and environmental characteristics of the context.

The need to overcome the traditional and rigid approach of rehabilitation-manuals, handbooks, and practice codes – primarily conceived as lists of architectural solutions for rehabilitationand, at times, the reconstruction of built heritage – calls for reflection on the real utility and practical implications of these tools. Not only specialized technicians, but also citizens, who are often unfamiliar with these topics, may find such tools inaccessible. Manuals, in fact, tend to offer a static and uniform view of historic buildings, reproducing catalogued elements in a mechanical and standardized manner, which is very close to technical training. In contrast, with the support of the Superintendence, the idea was formulated to create more accessible operational tools, designed to allow a wider audience to consider architecture not as the exclusive domain of experts or enlightened clients, but as a shared heritage, understandable and manageable by all (Degli Innocenti, 2005). These tools, while remaining accessible and usable by the majority, are designed to include the support of specialized technicians, essential for addressing specific local issues.

These new tools aim to replace a static and standardized view, an overly technical language, and the lack of flexibility with a clear and simple language, enriched by glossaries and dictionaries that promote architectural and technical language. Thus, a dynamic view of heritage is proposed, considering it as a living organism, in continuous evolution and subject to multiple and diverse transformations. Furthermore, the involvement of citizens is to be promoted, enhancing their knowledge and skills to encourage active participation in decision-making processes.

The adaptation of content to the different needs of users can be achie-

ved through simulations and interactive activities, as well as more accessible materials such as photographs, diagrams, infographics, and images. These tools, through the use of innovative and intuitive technologies and systems, aim to reinterpret the understanding of architecture from a smart perspective. Additionally, the difficulty caused by the lack of operational tools to support technicians in understanding intervention methods on built heritage must be addressed. It is not uncommon for projects to face delays and excessively long bureaucratic processes precisely because of this issue. In Sicily, very few, if any, administrations have adequate tools for the protection and enhancement of traditional architecture. This leads to interventions of low architectural value, a reduction in motivation among technicians – often discouraged and lacking virtuous examples to inspire them – and inadequate management by protection authorities.

The experience led to the creation of two volumes: one for the specific case of Polizzi Generosa, containing the Operational Guidelines for interventions on the existing built heritage, with detailed examples of interventions and references to the protection and enhancement of basic architecture, and another for the entire Madonie area, an atlas of technological solutions compatible with built heritage. The aim is to represent a dynamic and "always open" conception of solutions that can be applied on-site, where each individual element, each individual solution, is treated as a unique case, with a critical and contextualized approach, as well as being simple enough to help both technicians and citizens understand which solutions can be applied to local architecture (Ciaffi, 2011).

The atlas is therefore based on a "geographical" conception, where cataloguing is not exhaustive and dogmatic, but becomes a repository of critically analyzed cases in the perspective of knowledge and conservation, evolving into a living document that could be continuously updated with new information, solutions, and *best practices* drawn from experiences in other contexts, or in the specific case study. A range of possible and effective options to bring the local and rural building sector from a state of deterioration to contemporary conditions.

Thus, the Atlas of Technological Solutions for the Rehabilitationand Enhancement of the Inner Areas of the Madonie Park was conceived as an operational tool for technicians, municipal administrations, citizens, and local associations, with the aim of promoting the rehabilitationof existing building heritage and developing good practices compatible with the historical and cultural context. It seeks to simplify bureaucratic processes, as the technological solutions within it are validated by the Superintendence, and to guide design choices by offering innovative technological solutions that respect the built heritage, and thus are compatible with sustainability and the integration of tradition and innovation.

Its structure is the result of a series of reviews of various atlases, manuals, handbooks, and practice codes produced over the last twenty years by numerous sector technicians, aiming to combine the technical and operational feasibility of solutions with the practicality of understanding and replicability of operational choices, in terms of both application and the needs, requirements, and performance. It also includes examples of manuals and tools used in Barcelona that facilitated an approach close to the citizen and their needs, while also making them aware of everyday choices that improve both indoor and outdoor comfort through informed, daily decisions.

Firmitas, Utilitas, Venustas, as expressed by Vitruvius in ancient times, were considered as the pillars for the design of the support tools to be produced.

Structured in specific categories such as energy efficiency, seismic vulnerability, water recovery, universal accessibility, energy communities, urban aesthetics, digitalisation, community cooperatives, funding, *governance*, *business plans*, and acoustic adjustments, the atlas provides a detailed description of proposed solutions for each category, identified from the study conducted on *Smart Villages* around the world and the possibility of pur-

suing different paths towards achieving the smart concept. Each category includes practical examples, case studies of interventions already carried out in the territory or elsewhere (by contrast or analogy), and a quantitative sheet that allows evaluating the effectiveness of certain solutions in terms of user impact and costs. Additionally, there are guides and suggestions for entities, administrations, and associations to guide the territory with smart, innovative solutions that remain unexplored in the case of the Madonie.

The starting case study is the municipality of Polizzi Generosa, but the atlas primarily considers the other municipalities of the Madonie Park, offering a comprehensive overview of intervention possibilities in an area particularly rich in architectural, historical, and natural heritage. The aim is to create a network of thinking and collaborating villages from a technological perspective and contribute to the revival of the territories in a shared and cohesive way, leaving no one behind.

To identify the most suitable technological solutions, various Italian and European companies were contacted, selecting those capable of combining tradition and innovation. Demonstration samples were requested from the companies to verify their applicability, and meetings were organized to explore the characteristics and potential of each product.

Fig. II.3.2.1 | "Madonna degli Schiavi" or "Madonna della Porta" Church in Polizzi Generosa ©Luisa Lombardo, 2024.

II.3.3 Atlas of technological solutions for the rehabilitation and enhancement of the inner areas of the Madonie Park

The Atlas of Technological Solutions for the Rehabilitation and Enhancement of the Inner Areas of the Madonie Park represents a turning point in the approach to the protection and enhancement of the architectural and natural heritage of this region. This project arises from the need to respond to the guidelines outlined by the National Rehabilitationand Resilience Plan (PNRR), which offers an extraordinary opportunity for the revitalisation of Italy's inner areas through targeted interventions for the rehabilitationand regeneration of rural contexts. In this framework, the Atlas serves as both an operational and strategic tool for integrating modern technologies with the historical, cultural, and environmental characteristics of the Madonie territory, offering innovative solutions that are deeply respectful of local traditions and the protected environment.

The initiative, in line with the dynamic of *Smart Villages*, aims not only at simple conservation of heritage but also at transforming it into a driver of sustainable development, contributing to the economic, social, and cultural growth of the Madonie. The overarching ambition is to propose an integrated strategy that starts from considering the built heritage, the possibilities of compatible recovery, and involving both public and private *stakeholders*, local communities, and sector professionals in a regeneration process that touches both the material aspects of heritage—such as historic buildings and rural and natural landscapes—and immaterial ones, such as cultural traditions and local identities, as well as *governance* management processes to help small communities like the one under examination emerge and find the necessary stimulus for shared projects.

Several particularly innovative and useful reference cases for the territories have been considered, including the Barcelona Atlas and the Guidelines for Improving Energy Efficiency in Cultural Heritage, prepared in 2015 by the Superintendence of Archaeology, Fine Arts, and Landscape for the Metropolitan Area of Venice and the provinces of Belluno, Padua, and Treviso. These tools represent key elements for technological development and innovation in territorial contexts and have worked extensively in northern Italy for rehabilitationand enhancement processes.

The index of the Madonie Park Atlas is structured to guide technicians, administrations, and local communities in the rehabilitationactivities of building heritage, ensuring respect for the historical and cultural peculiarities of the territory. The Atlas begins with an introductory section and proceeds by outlining the purpose of the guidelines, illustrating their aims and criteria, alongside the main regulatory provisions.

This initial framework serves to contextualise and orient the subsequent

sections, facilitating a clear understanding of the possible intervention methods. Next, a section dedicated to the analysis of the Madonie context explores architectural assets in relation to the Code of Cultural Heritage and Landscape, focusing on smaller centres and the technical-construction characteristics of historic buildings, with specific *insights* into the urban fabric, building types, and isolated heritage assets. This part provides an essential knowledge base for intervening consciously and respecting local history and identity.

The main objective of the Atlas is to provide a comprehensive framework of criteria, solutions, and tools that can guide the rehabilitationand requalification interventions of the rural areas of the Madonie, based on the principles of economic, environmental, and social sustainability. This approach is grounded in the need to ensure that interventions respect and enhance local specificities, maintaining the bond between the architectural heritage and the surrounding landscape. At the same time, it aims to promote technical practices that make interventions more efficient, smoother, and able to overcome the bureaucratic and technical issues often encountered in rehabilitationprojects in Sicily and the Province of Palermo.

The long-term goal is to activate a virtuous circle that, through compatible solutions, guarantees the rehabilitationof heritage and generates positive impacts on the entire local community, creating new employment opportunities, promoting sustainable tourism, and strengthening the region's economic fabric. A “smart” approach, which values the use of digital technologies and innovative solutions to optimise resource management and the quality of life for the communities involved (Ciaffi, 2011).

It is divided into several sections, each addressing crucial issues for the rehabilitationand enhancement of the Madonie heritage, highlighting the centrality of matters such as energy sustainability, resilience to climate change, landscape protection, and the regeneration of historic centres.
Among the main topics covered by the Atlas are:

- **energy efficiency of historic buildings:** improving the energy performance of the built heritage without altering its architectural and historical characteristics. The Atlas proposes advanced technological solutions, such as the use of high-performance natural materials, the integration of low-visual-impact systems, and the use of passive technologies that exploit environmental features to reduce energy consumption;
- **seismic vulnerability and structural improvement:** ensuring the safety of historic buildings through targeted structural interventions. The Atlas offers a series of guidelines on how to intervene on historic buildings to enhance their seismic resistance while respecting traditional construction techniques;
- **water resource management:** solutions for optimising water resource management, through rainwater collection and reuse, the creation of low-consumption irrigation systems, and the enhancement of traditional agricultural practices that ensure sustainable land management;
- **accessibility and inclusivity:** technical solutions to improve the accessibility of historic buildings and public areas without compromising the architectural and landscape value of the existing heritage;
- **economic and social sustainability:** a central aspect of the project is ensuring that rehabilitationand enhancement interventions have a positive economic and social impact. The Atlas provides tools for creating *business plans* and local development strategies that can promote entrepreneurship and sustainable tourism, generating new economic opportunities for local communities.

The impact on the Madonie territory is, in this way, multiple and potentially of great significance. Firstly, the rehabilitationand enhancement of the architectural and natural heritage contribute to preserving the cultural and historical identity of the local communities, strengthening the bond between the population and their territory. Secondly, the planned interventions aim to improve the quality of life for residents by creating more accessible,

safer, and efficient public spaces, and introducing technologies that reduce energy consumption and improve environmental sustainability. Lastly, it also supports technicians in the preliminary project assessments and in providing suitable documentation.

From an economic perspective, the regeneration of heritage can act as a catalyst for the development of new economic activities related to tourism, sustainable agriculture, and local craftsmanship. In this sense, it does not only propose technical solutions but also provides guidance on how to transform heritage rehabilitationinto an opportunity for economic and social growth for the Madonie.

It integrates a Smart approach to heritage management, based on the use of digital technologies and innovative solutions to optimise resource management and improve the efficiency of interventions. The network maps, which close the operational chapters, also show the situation of the Madonie sector, enabling the identification of the most virtuous municipalities or those in a favourable position across the entire territory, thus serving as a key tool to promote collaboration between the different municipalities of the Parco delle Madonie, creating synergies between virtuous projects, optimising the use of public and private resources, as well as promoting and spreading awareness about what can be done and how collaboration is possible.

In conclusion, the Atlas of Technological Solutions for the Rehabilitationand Enhancement of the Inner Areas of the Parco delle Madonie represents a comprehensive and structured guide to addressing the challenges of rural heritage rehabilitationin Sicily, with an integrated vision that combines technological innovation and respect for local traditions. Its impact could significantly contribute to the sustainable growth of the territory, in line with the objectives of the PNRR, strengthening the identity of local communities and offering new prospects for economic and social development.

Fig. III.3.3.1 | In Petralia Soprana ©Salvatore Fiume, 2023.

Fig. III.3.3.2 | Research Methodology at the Superintendence of Cultural Heritage of Palermo ©Luisa Lombardo, 2023.

III.3.3.1 Methodology for the explanation of the Atlas

The Atlas has been designed as both an operational and analytical tool, aimed at providing an in-depth understanding of the unique characteristics of the Madonie territory and defining targeted intervention strategies. The methodology adopted for its consultation is based on a systematic and interdisciplinary approach, structured according to the different thematic and applied sections outlined in the index.

The methodological process begins with the introduction (Chapter 1) and the explicit clarification of the objectives and guiding criteria (Chapter 2), accompanied by an overview of the main regulatory provisions. This preliminary section is essential for providing a general framework and understanding the motivations and goals underlying the overall structure of the Atlas.

Chapter 3 forms the core of the document, offering a detailed analysis of the architectural and landscape context of the Madonie. In this section, the architectural assets are examined in relation to current regulations, the characteristics of smaller towns, and the distinctive features of historic buildings, with particular attention to the urban fabric, building types, and isolated heritage assets. This knowledge base forms the necessary foundation for understanding the evaluation criteria and intervention strategies that follow.

The subsequent chapters (4-13) address specific issues through a rigorous methodological structure that includes diagnosing the current situation, analysing critical issues, and developing improvement procedures. This part examines fundamental aspects such as the environmental quality of historic buildings, energy efficiency, seismic vulnerability, accessibility, urban aesthetics, and water resource management. Each topic is accompanied by operational guidelines that balance the need to protect heritage with innovative and sustainable solutions.

Of particular significance is Chapter 5, dedicated to illustrative sheets, which provides practical tools for applying the theoretical content. Through concrete examples, *best practices*, and network maps, this section enables a direct translation of the analyses into operational interventions, making the Atlas an immediately usable resource for technicians and administrators.

Furthermore, the Atlas stands out for its introduction of smart criteria, covered in Chapters 9-17. These criteria represent an innovative approach to land management, integrating technology, sustainability, and tradition. Topics addressed include the digitalisation of the built heritage, the formation of energy communities, the implementation of effective *governance* systems, and the promotion of community cooperatives, all key tools for fostering social cohesion and local development.

The final chapters, dedicated to the development of *business plans*, management of funding, and the achievement of the 2030 Agenda goals, offer a long-term strategic perspective, guiding the content of the Atlas towards the concrete implementation of sustainable and lasting interventions.

The consultation methodology thus reflects the structure of the Atlas: a progressive path that, starting from a deep understanding of the territory, guides the reader through analytical and design criteria towards the definition of practical strategies, capable of combining heritage protection with technological innovation in an integrated and sustainable approach.

The index of the Atlas is presented below for prior consultation:

1. INTRODUCTION
2. OBJECT OF THE GUIDELINES
- 2.1 - Objectives and criteria
- 2.2 - Overview of key regulatory provisions

3. KNOWLEDGE OF THE MADONIE CONTEXT
- 3.1 - Architectural heritage in reference to the Cultural Heritage and Landscape Code
- 3.2 - Minor centres of the Madonie Park
- 3.3 - Analysis of the technical and construction characteristics of historic buildings
  - 3.3.1 - The urban fabric and basic buildings
  - 3.3.2 - Building types
  - 3.3.3 - Isolated heritage assets

4. EVALUATION OF THE ENVIRONMENTAL QUALITY OF HISTORIC BUILDINGS
- 4.1 - Thermal comfort
- 4.2 - Visual comfort
- 4.3 - Acoustic comfort
- 4.4 - Air quality
- 4.5 - Environmental quality

5. ILLUSTRATIVE SHEETS
- 5.1 - Scope of application
- 5.2 - Template sheet
- 5.3 - *Best practices*

5.4 - Interventions on the architectural structure
5.5 - Examples in the territory
5.6 - Measures for the user
5.7 - Quantitative analysis
5.8 - Network maps
6. CATEGORIES
7. EVALUATION OF ENERGY EFFICIENCY FOR BUILT HERITAGE AND INTERVENTION PROPOSALS
7.1 - Energy diagnosis of historic buildings
7.2 - Procedures for improving the energy efficiency of buildings
Index of identified technological solutions
8. EVALUATION OF SEISMIC VULNERABILITY OF BUILT HERITAGE AND INTERVENTION PROPOSALS
8.1 - Seismic vulnerability diagnosis of historic buildings
8.2 - Procedures for improving seismic vulnerability of buildings
Index of identified technological solutions
9. EVALUATION OF SMART CRITERIA FOR WATER RehabilitationAND INTERVENTION PROPOSALS
9.1 - Water rehabilitationdiagnosis
9.2 - Procedures for water recovery
9.3 - Water consumption in our homes
9.4 - Water conservation VS drought
Index of identified technological solutions
10. EVALUATION OF SMART CRITERIA FOR IMPROVING ACCESSIBILITY AND INTERVENTION PROPOSALS
10.1 - Accessibility diagnosis
10.2 - Procedures for improving accessibilit
Index of identified technological solutions
11. EVALUATION OF SMART CRITERIA FOR THE FORMATION OF ENERGY COMMUNITIES AND INTERVENTION PROPOSALS
11.1 - Energy communities
11.2 - Essentials
11.3 - Characteristics of an energy community
12. EVALUATION OF SMART CRITERIA FOR IMPROVING URBAN AESTHETICS AND INTERVENTION PROPOSALS
12.1 - Urban aesthetics diagnosis
12.2 - Procedures for improving urban aesthetics
Index of identified technological solutions
13. EVALUATION OF SMART CRITERIA FOR ACOUSTIC ADAPTATION
13.1 - Acoustics diagnosis
13.2 - Procedures for acoustic improvement
Index of identified technological solutions
14. ACTIVE MEASURES, PASSIVE MEASURES, AND HEALTH AND COMFORT

15. EVALUATION OF DIGITALISATION CRITERIA FOR BUILT HERITAGE

16. EVALUATION OF SMART CRITERIA FOR FORMING COMMUNITY COOPERATIVES

17. EVALUATION OF SMART CRITERIA FOR GOVERNANCE APPROACHES

18. BUSINESS PLAN

19. EVALUATION OF SMART CRITERIA FOR MANAGING FINANCING

20. Towards the Goals of the 2030 Agenda

Within the Atlas, by way of example, a breakdown sheet is presented that illustrates a proposed technological solution for the improvement of built heritage. The reading of the sheet requires a systematic approach that follows a precise logical order: from top to bottom and from left to right, to ensure a complete and structured understanding of the information provided.

The left-hand portion of the sheet, as shown below, is dedicated to the detailed description of the technological solution. The main elements, listed in sequence, are as follows:

- **title of the proposed solution:** a concise heading that identifies the intervention;
- **operating principle:** a technical explanation outlining the mechanism behind the solution;
- **applicability:** an indication of the conditions and contexts in which the proposal can be implemented;
- advantages, disadvantages, and risks: a critical evaluation highlighting the potential benefits, limitations, and any issues associated with adopting the solution;
- **synergies and interactions:** an analysis of possible connections with other interventions or the context in which the solution is applied;
- **relevant regulations:** a final section providing legislative or regulatory references to ensure compliance and safety in its application.

In. 26 COPPI FOTOVOLTAICI INVISIBILI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede lo smontaggio e la sostituzione dei coppi tradizionali esistenti con coppi fotovoltaici per la produzione di energia solare mantenendo inalterato l'aspetto estetico e la funzionalità della classica copertura in cotto. Ciascun modulo o coppo, generalmente, risulta formato con un composto polimerico atossico e riciclabile, che viene appositamente lavorato per incentivare l'assorbimento dei fotoni. All'interno del modulo sono incorporate delle normali celle di silicio monocristallino. La superficie, opaca alla vista e trasparente per i raggi solari, permette alla luce di entrare ed alimentare le celle invisibili.

APPLICABILITÀ

L'installazione del coppo si effettua con pochi e semplici passaggi. Il sistema è simile a quello utilizzato per i classici coppi in cotto e permette di sostituire la copertura esistente senza bisogno di strutture aggiuntive. È pratico da installare, non necessita di strutture aggiuntive e sostituisce i coppi di copertura esistenti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Il Coppo invisibile si distingue dalle altre tecnologie fotovoltaiche e dai classici coppi in cotto, grazie a particolari caratteristiche che lo rendono unico.

- INTEGRATO: Installato come un coppo in cotto, si mimetizza nella continutà estetica del tetto.
- FOTOCATALITICO: La luce attiva un processo naturale e infinito che purifica l'aria mentre pulisce la superficie del coppo.
- RESISTENTE: Può sopportare un elevato carico statico, non teme solventi chimici e agenti atmosferici.
- SOSTENIBILE: Realizzato con materiali atossici, anche naturali o da riuso, tutti riciclabili.

Svantaggi: Necessitano di continua manutenzione per valutare l'efficienza e l'efficacia, si consiglia il controllo a campione. La resa è poco inferiore rispetto ad un normale pannello fotovoltaico.

Rischi: La colorazione potrebbe risultare non esattamente fedele ai coppi originali, ma di un rosso leggermente più accentuato a causa della produzione al dettaglio.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza, occorre verificare le caratteristiche energetiche, essendo prodotti a mano, infatti, necessitano di un controllo saltuario per la verifica del funzionamento. Il sistema funziona meglio se collegato all'impianto di riscaldamento per la produzione di calore e ACS.

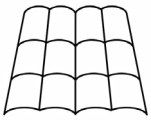
NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017

The right-hand portion of the sheet focuses on the classificatory aspects and the practical impact of the technological solution, organised into the following points:

- **affiliated category of the Atlas:** the main thematic category to which the solution belongs, for example, energy efficiency, accessibility, or urban decor;
- **technical element considered:** the part of the building or system affected by the intervention;
- **action adopted in the building:** the specific function performed by the solution, such as thermal insulation, reduction of water consumption, or improvement of acoustics;
- **compatibility, reversibility, and invasiveness:** an analysis of the technical characteristics of the intervention in relation to the historical and architectural context, assessing its integration with the protected asset;
- **actions towards safeguarding:** a description of the practical effects of the solution on the building system, such as structural improvements or environmental comfort enhancements;
- **type of application:** a classification distinguishing between direct, indirect, or experimental applications;
- **illustrative diagram:** at the end, a small technical diagram or explanatory drawing is provided to visualise the proposed solution, highlighting its construction details or conforming configuration.

The reading of the sheet should follow the indicated order, with particular attention to the correspondence between the information contained in the left and right sections. This approach allows for a coherent connection between the analytical description of the solution and its technical and regulatory aspects, offering an integrated and functional overview.



DISPOSITIVI CAPTAZIONE E.S.

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

INCOLORE

TIPOLOGIA DI APPLICAZIONE

POSIZIONAMENTO NELL'INTERA COPERTURA

ESPOSIZIONE NELLA FALDA SUD

II.4 The foreign Research experience in Valencia: analysis and comparison with Smart Villages in Spain

In line with the objectives of the research grant awarded by INPS, the study period in Valencia, Spain, was supervised by Professor Arturo Zaragozá Catálan at the Real Academia de Bellas Artes de San Carlos de Valencia, with additional support from Professor Rafael Marín Sánchez of the Universitat Politècnica de València. The research period, lasting three months from February/March 2023 to June/July 2023, followed a plan established with the professors on 20 October 2022 and allowed for the identification of similarities and differences between the Valencia area and the study area in Italy.

During the first month, the analysis focused on studying local architecture, materials, and the most common construction techniques used, to gain a thorough understanding of the built heritage in the Valencia region. This was complemented by an evaluation of the technological behaviour of building aggregates, aimed at fully understanding the characteristics of the buildings under analysis. This approach enabled a comparison between the typological and technological solutions in Valencia and those in Italy, identifying methods and solutions for improving the existing building stock.

The work was supported by periodic checks with tutors from the University of Palermo, the Real Academia de Bellas Artes de San Carlos, and the Superintendency of BB.CC.AA. of the Province of Palermo, to systematise the methodologies and approach adopted. The research programme was structured in several phases, including the study of the inner areas of Valencia, the typological analysis of the built heritage, investigation into construction technologies and historical materials, as well as an in-depth look at rehabilitationstrategies, energy efficiency, and seismic adaptation. This allowed for continuous comparison between the Italian and Valencian contexts, identifying sustainable technological strategies that could be applied to both building heritage sites.

The period abroad also proved to be a crucial resource for the development of the Guidelines for the Municipality of Polizzi Generosa and the Atlas for the Madonie area, promoting the identification of technologies and rehabilitationand energy efficiency strategies for built heritage that could also be applied in the Madonie area and other Mediterranean contexts.

Fig. II.4.1 | Valencian Community ©InformagiovaniItalia, 2023.

II.4.1 Territorial framework

From a territorial perspective, the city of Valencia, located on the eastern coast of the Iberian Peninsula, stands out for its remarkable morphological and geographical diversity. The landscape consists of a flat and sandy coastal strip, while to the west, there are mountainous areas that almost serve as a natural boundary with the rest of the peninsula. This geographical division creates a clear duality in the territory, distinguishable in two main zones: a coastal area and a more innerone, including intermediate and mountainous or rural areas (Eaude, 2019).

The Valencian coastline stretches for about 500 kilometres along the Mediterranean Sea, including internationally renowned sandy beaches, such as Malvarrosa and Albufera, a significant coastal lagoon that represents one of the most important wetlands in Spain. Albufera is not only a protected natural area but also a symbol of local identity, due to its rice production,

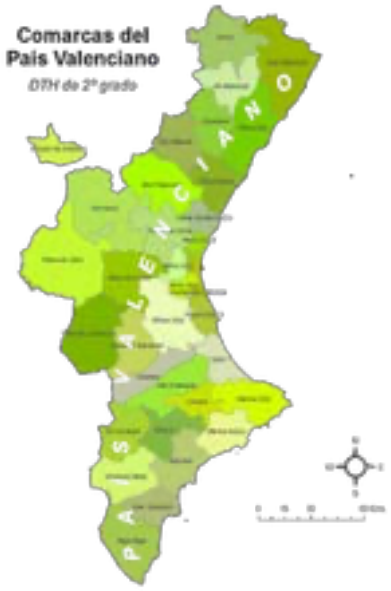


Fig. II.4.2 | Valencian Comarcas ©Wikimedia, 2023.

Fig. II.4.2.1 | Residential building in the centre of Valencia ©Luisa Lombardo, 2023.

Fig. II.4.2.2 | Detail of Valencian Tapia ©Luisa Lombardo, 2023.

used in the famous Valencian paella. This interaction between the natural environment and human use makes the coastal territory a model of coexistence between agricultural tradition and modern tourism.

The eastern area faces a vast port, which plays a fundamental role in the regional economy, both as a docking point for cruise ships and as a strategic commercial hub for the Mediterranean, facilitating trade with port cities in Italy, France, and Tunisia. Valencia is the fifth-largest European port by cargo volume and the first in the Mediterranean, thanks to its modern infrastructure network, including high-speed rail links and an international airport (Caratozzolo, 2007).

Internally, Valencia is divided into 34 comarques, the equivalent of our provinces, each characterised by distinctive elements derived from the diversity of the landscape and the traditions of local communities. The inner-comarques, such as Los Serranos or Alto Palancia, are dominated by mountainous and rural landscapes, contrasting with the more densely populated urban areas along the coast. This geographical variety is also reflected in local economies: while the coast is heavily oriented towards tourism and commerce, the inner areas focus on agriculture, livestock, and, in some areas, the artisanal processing of agricultural products, such as olive oil and wine (Eaude, 2019).

The population of the Valencia region is approximately 5,005,737 inhabitants, spread over an area of 685.43 km². The city itself represents the nerve centre of a metropolitan area that significantly contributes to the region's population density. The climate, typically Mediterranean, is temperate, with an average annual temperature of 18.3°C. The lowest temperatures are recorded in January, with 11.9°C, while heat peaks, from February onwards, can reach up to 40°C, as happened in February 2024. In summer, August sees an average temperature of 26.1°C, often exceeding 30°C; today, it is one of the hottest cities in the Mediterranean, after Seville.

Precipitation, mainly concentrated in the autumn, plays a key role in shaping the landscape. During these months, "gota fría" phenomena—intense weather events typical of the region—can cause sudden flooding, significantly impacting agriculture and infrastructure. Despite this, the region's water resources are well managed, thanks to a centuries-old tradition that includes the "water tribunals," medieval institutions still active today to resolve conflicts related to the management of irrigation canals (UrbiStat, 2024).

The combination of these features makes Valencia a dynamic and strategic region, capable of integrating a rich tradition with the needs of sustainable contemporary development.

II.4.2 Material-construction peculiarities

Although in recent years Valencia has earned titles such as *green* and accessible city, its construction history is inextricably linked to its identity. In particular, it becomes evident that, although rural areas and the city centre are quite distanced, the material and construction peculiarities adopted are the same. This analysis was deepened in the historic centre of Valencia, conducted under the guidance of the doctoral supervisor, to better understand and analyse the basic construction of the small towns in the Valencian area. The city's architectural heritage is characterised by residential and monumental buildings, typically featuring double-height entrance doors (*Fig. 1*), ground-floor stables, and noble upper floors. The symmetry and linearity of the facades are consistent throughout the historic centre. Monumental buildings are mainly constructed with a load-bearing structure made of squared stone blocks and often feature inner courtyards (*Fig. 6*), using traditional construction techniques such as bóvedas tabicadas, widespread in Valencia and across Spain, very similar to the vaulted ceilings found in the Madonie area (Benlloch, 1995). This technique uses brick for buildings of lower value, and stone for monumental ones, reaching its peak in the grandest architectures of the city, such as the Lonja de la Seta (*Fig. 7*) in the heart

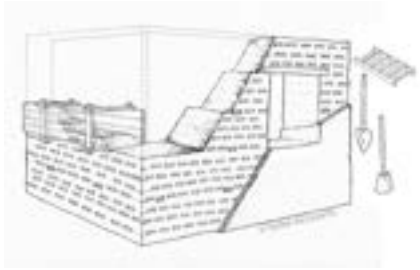


Fig. II.4.2.3 | Drawing of Tapia Valenciana ©Terra Incognita, 2023.

of the city.

Bóvedas tabicadas are indeed a distinctive element of Valencian architecture, with a rich history dating back to the medieval era. These are vaults made by laying flat or curved tiles (*Fig. 8*) in successive courses, placed dry, without the use of mortar or centering (Albarran et al., 1885). Known for their structural lightness, combined with high resistance to weight and stress, this construction technique allows for various geometric forms, such as barrel vaults, ribbed vaults, and domes, adapting to different architectural needs (Moya Blanco, 1947). Furthermore, brick provides excellent thermal insulation, helping to maintain a comfortable inner climate in buildings, with outstanding soundproofing properties, contributing to a pleasant acoustic environment, and the texture created by the tiles gives the vaults a unique and distinctive aesthetic, enhancing the architectural value of the buildings (Redondo, 2013).

In addition to the *bóvedas tabicadas*, another example of widely used historical construction technology is the tapia valenciana (*Fig. 4*), a traditional building technique employed in the Valencia region, Spain, using raw earth (Sanchis, 1926) in a sack-like manner. The technique involves compacting a mixture of clay, sand, and water inside a formwork called "*tapial*" (Font et al. 1991), made of brick. The earth is pressed manually or with the help of a pile driver, creating successive layers until the desired height of the wall is

Fig. II.4.2.4 | Palace of the Valencian Government ©Luisa Lombardo, 2023.

Fig. II.4.2.5 | Llotja de la Seda ©Luisa Lombardo, 2023.

Fig. II.4.2.6 | Example of Bóvedas Tabicadas in the center of Valencia ©Luisa Lombardo, 2023.

Fig. II.4.2.7 | Museum of Valencian and Flemish Art ©Luisa Lombardo, 2023.

Fig. II.4.3.1 | Valencia Cathedral ©Luisa Lombardo, 2023.

Fig. II.4.3.2 | Residential Accessibility ©Luisa Lombardo, 2023

Fig. II.4.3.3 | Urban Accessibility ©Luisa Lombardo, 2023.

reached (*Fig. 5*). *Tapia valenciana* uses only locally available natural materials, such as clay and sand; for this reason, it can be considered a vernacular construction technique (Friedman, 1995). This makes it a sustainable construction method with a low environmental impact. *Tapia valenciana* walls are very durable and long-lasting. They can last for centuries, as evidenced by numerous historic buildings in the historic centre of Valencia (Zaragozà, 2011). Raw earth has high thermal inertia (Keable, 1996), which makes *tapia valenciana* walls (*Fig. 5*) energy efficient, helping to reduce energy consumption for heating and cooling buildings. It is a versatile technique that can be used to create various types of walls, such as load-bearing walls, partitions, and enclosures (Lopez et al., 1996); it can be adapted to different shapes and curvatures, offering great architectural freedom.

Today, many construction sites are underway both in the historic centre and the outskirts of Valencia. However, while the city centre still tries to preserve its characteristic historical construction features, the outer areas see more freedom in building design, leading to a noticeable shift with very modern buildings employing innovative construction techniques far removed from traditional methods. The rehabilitationof traditional architecture, however, represents a fundamental reference point for the city, which places great importance on protection and conservation, applying and enhancing historical construction techniques, and promoting a construction tradition that must not be lost in any way.

II.4.3 Rehabilitation and enhancement experience. Valencia, an innovative city

Although a custodian of unique construction traditions (Maldonado et al., 2002), Valencia is a city that has over time sought to adapt to modern needs and promote the rehabilitationand accessibility of both residential and urban spaces. All urban areas, both private and public, are designed and restored to be used by a wide variety of users. In recent years, ramps and urban lifts (*Fig. 2*) have been implemented to, for example, reach numerous underground car parks, thus reducing the presence of cars in the historic centre. Valencia has, therefore, normalised its architectural heritage to meet contemporary living needs, aligning with the principles of *Design for All*. Accessibility has also been extended, particularly to monumental complexes, with the installation of steel ramps to ensure broader access to cultural heritage. These interventions can be observed in some of the city's main monuments, symbolising a Valencia capable of blending its historical past with innovative technological solutions. At the same time, this stands in contrast to Italian policies and heritage protection laws, which often do not allow for such interventions, even using materials that are not traditionally associated with heritage restoration. A significant example is the ramp at the Cathedral of Valencia, dedicated to the Assumption of Mary (*Fig. 1*).

To aid visitor understanding, all museums and monumental complexes have also been equipped with digital access via QR codes, allowing access to information and the enjoyment of the historical, architectural, and cultural heritage in various languages. An audio/textual support system ensures the user's autonomy, enabling them not only to explore but also to learn and understand local architecture independently using their own smartphones.

In recent years, Valencia has implemented policies for the rehabilitationof built heritage and energy efficiency, much like Italy's Superbonus and Ecobonus schemes, taking advantage of opportunities provided by European funding for energy efficiency and built heritage recovery. Specifically, plans have been developed that align with the directives undertaken by Italy, such as the RENHATA Plan, the PREE 5000, IEEV.CV, the NEXT GENERATION programme, and other incentives for the purchase and rental of housing. An analysis of these individually:

The RENHATA Plan, funded by the Generalitat Valenciana, promotes energy rehabilitation and the refurbishment of residential buildings. Its objectives include improving energy efficiency, reducing CO2 emissions,

Fig. II.4.3.4 | Urban Elevator ©Luisa Lombardo, 2023.

Fig. II.4.3.5 | Prototype for Increasing the Surface Area of Apartments in Valencia ©Mira Comunitat Valenciana, 2023.

Fig. II.4.3.6 | Photovoltaic panels in Valencia ©Krib, 2023.

Fig. II.4.3.7 | Green walls in the Monumental Cemetery of Valencia ©Luisa Lombardo, 2023

promoting environmental sustainability, and enhancing the living conditions of residents. It targets property owners, condominium administrators, and tenants (with the owner's consent) for interventions such as thermal insulation, replacement of windows, installation of efficient heating and cooling systems, and building renovations to improve accessibility. The incentives include grants, low-interest loans, and tax deductions, requiring an online application via the Generalitat Valenciana website.

The PREE 5000 is an energy rehabilitation programme promoting the energy efficiency of existing buildings in municipalities with fewer than 5,000 inhabitants, addressing demographic challenges such as depopulation. Eligible interventions include improving thermal insulation, replacing thermal systems with renewable energy sources, and enhancing lighting efficiency. The subsidies range from 50% for improving thermal insulation to 20% for lighting efficiency.

In recent years, Valencia has also introduced the IEEV.CV, a mandatory document for residential buildings in the Valencian Community, assessing conservation status, accessibility, and energy efficiency. Similar to Italy's APE Certificate, it is valid for 10 years from online submission and provides information on construction characteristics, conservation status, deficiencies, and recommendations for maintenance and rehabilitation of the building. The NEXT GENERATION Programme, on the other hand, focuses on facilitating property purchases and the rehabilitation of properties for young people under 35.

Among the innovative initiatives, the MIRA Digital Platform stands out, aimed at promoting good practices in heritage recovery. It serves as an online repository of all virtuous projects, competition outcomes, and ongoing experiments to improve habitability. This is important because the rehabilitationprocess, particularly considering the small sizes of homes prescribed by Spanish technical regulations, often requires solutions that are not always suitable, necessitating innovative and technologically advanced interventions. Involving Valencian institutions, companies, architecture firms, and universities, the platform collects interventions validated by the Heritage Office, technicians, and the Real Academia de Bellas Artes de San Carlos de Valencia (Valencian Heritage Office), contributing to the search for *best practices* in the management and rehabilitationof existing architectural heritage. One example of innovation is the extension of balcony surfaces with a steel and wood structure, creating a larger area (*Fig. 13*), while respecting Spain's projection limitations (no more than 50 cm).

Valencia's energy landscape is undergoing a significant transformation with the growing adoption of energy communities, supported by Spanish legislation since 2019. The government provides incentives such as grants, zero-interest loans, and tax deductions, fostering an environment conducive to sustainable energy practices. Energy communities such as El Cabanyal and Paterna are already active, although the limited presence of photovoltaic panels in large historic centres prevents widespread diffusion. An innovative example in this regard is the implementation of an energy community in the monumental cemetery (*Fig. 14 and 15*), using the roofs of crematoriums and ossuaries to produce sustainable energy, while preserving the city's historical heritage. Likewise, the presence of green walls contributes to both the aesthetics and air quality.

Valencia also stands out for its virtuous *governance*. The actors of the Valencian community are actively involved, with working groups on sustainability within the City Council and technical assistance provided by the Aguas de Valencia Foundation. The Sustainable Tourism Working Group, affiliated with the Visit Valencia Foundation, focuses on initiatives such as calculating the carbon footprint across 151 indicators, improving air quality, and restoring natural ecosystems and wetlands. It is no coincidence that, since 2024, Valencia has been a European Green Capital, recognising the city's commitment to sustainability and overcoming environmental challenges through a collaborative approach, marking a significant step toward

Fig. II.4.3.8 | Valencian territory ©Luisa Lombardo, 2023.

a more sustainable and conscious energy future where the community plays a decisive role.

II.4.4 Minor villages in the Valencian hinterland

The territory of Valencia is divided into three main areas: to the north, Castellón; in the center, Valencia; and to the south, Alicante. The Castellón area, in particular, has been highlighted for the richness of its small rural communities, such as the municipalities of Morella and San Mateo, exploring the architectural and cultural peculiarities of these regions. These considerations were made due to the similarities in territorial features with the Madonie region.

The *Setena* area, another subject of study, consists of seven villages in the *Tinença de Benifassà* Natural Park, rich in natural heritage, and was also considered for its similarities with the Madonie Park and its 21 villages. This area has been promoted and enhanced through nature trails aimed at communication and connection between villages, all sharing nature as a common denominator.

The *Pereroles* Natural Park and *Albufera*, famous for its lagoon and the local initiatives to enhance it, as well as the regional paella, are two examples of the predominant natural assets in the territory. Despite the population decline in these areas in recent years, there are ongoing projects for rehabilitationand energy efficiency, including European programs and local initiatives to improve housing conditions and accessibility.

During the detailed analysis of some pueblos in Valencia, all part of the Annex I of the Case Study Booklet, many of them have undergone digitalisation in recent years, especially the larger pueblos like Morella and Xàtiva, due to the increase in tourist flows. The presence of numerous castles that characterize these pueblos serves as an incentive for their valorization and tourism, confirming the monumental heritage as one of the main attractions, also because they are well-connected by bus and train. Additionally, young people under 30 can get a free subscription for unlimited train travel to encourage not only the use of public transport but, more importantly, easier travel for study or work between Valencia and the smaller pueblos.

In addition to the pueblos, which preserve valuable architecture, similar to the Madonie area, the rural territory of Valencia is characterized by isolated heritage buildings, such as the riurau, farmhouse, baracca, nevai, and cebera, representing a widespread and rich architectural heritage full of traditions that shape the Valencian landscape.

The riurau, for example, is a significant example of typical rural architecture in Valencia, historically used for grape processing, with architectural features that harmoniously blend with the surrounding environment. Similarly, the other heritage buildings embody the authenticity of rural constructions, each with unique characteristics and a history rooted in Valencian culture. It is interesting to note that this rural Valencian architecture, in some aspects, may recall the architecture of the Madonie Geopark in Sicily. Both contexts feature a rich diversity of rural buildings, contributing to the creation of a unique landscape closely linked to agricultural activities and local traditions. The similarities may lie in construction techniques, materials used, and the integration of structures with the surrounding natural environment, as both are vernacular buildings. This architectural affinity between Valencia and the Madonie in Sicily underscores the richness and variety of European rural traditions spread across the Mediterranean Basin and Europe. Both territories, while maintaining their cultural identity, show an intrinsic connection between architecture and rural life, highlighting the importance of preserving and enhancing this shared heritage, which defines the landscape.

A key role in the protection and rehabilitationof architectural heritage is played by the numerous manuals for the rehabilitationof the historic centers of the small pueblos in Valencia, a widely used tool for their rehabilitationand enhancement. Generally, the task of creating them is entrusted by

the Generalitat Valenciana to some architects and professors from the University who have distinguished themselves in the protection and enhancement of small territorial contexts and especially in the professional practice dedicated to the rehabilitationof traditional architecture.

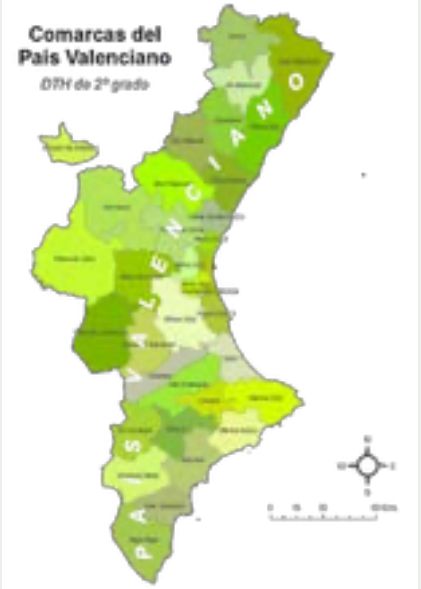
Similarly to Polizzi Generosa, a territorial examination was carried out for Valencia to immediately understand the territory, as detailed in the following sheets.

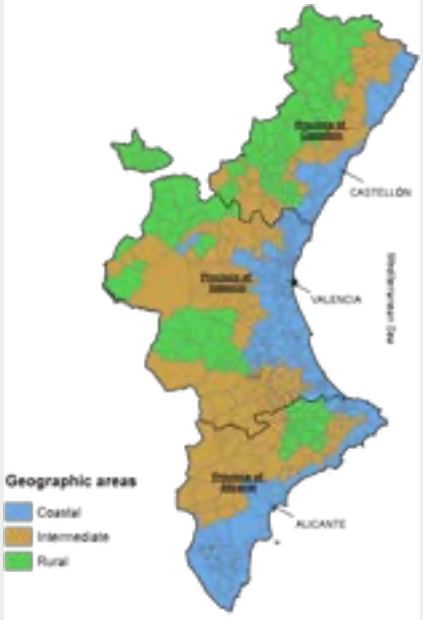
The research experience in Valencia represented an extraordinary opportunity to deepen the study of architectural heritage and the rehabilitationstrategies adopted in a cultural and geographical context distant from the Italian one. Thanks to the guidance of prominent academics and the exploration of local construction techniques and energy efficiency policies, it was possible to identify similarities and differences compared to the Sicilian context.

This comparative perspective enriched the knowledge base with tools and strategies useful for understanding the most appropriate actions to undertake for the rehabilitationand enhancement of the Madonie inner areas. Specifically, the approach adopted in Valencia, characterized by the combination of tradition and innovation, attention to accessibility, and the promotion of sustainability, offers *insights* applicable to the Madonie territory, also in terms of *governance* and community involvement. The data and methods collected during the three-month research extend beyond the technical field, providing a framework for an integrated vision for the revival of inner areas. Therefore, this experience represents a crucial step in defining concrete guidelines capable of combining the valorization of heritage with the needs of contemporary living, benefiting not only the Madonie but also other areas of the Mediterranean Basin facing similar challenges.

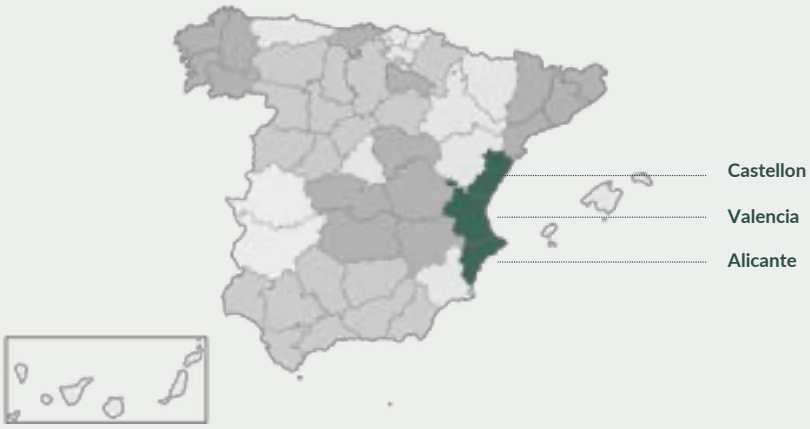
Fig. II.4.4.1 | Albufera in Valencia ©2023, Luisa Lombardo.

VALENCIA

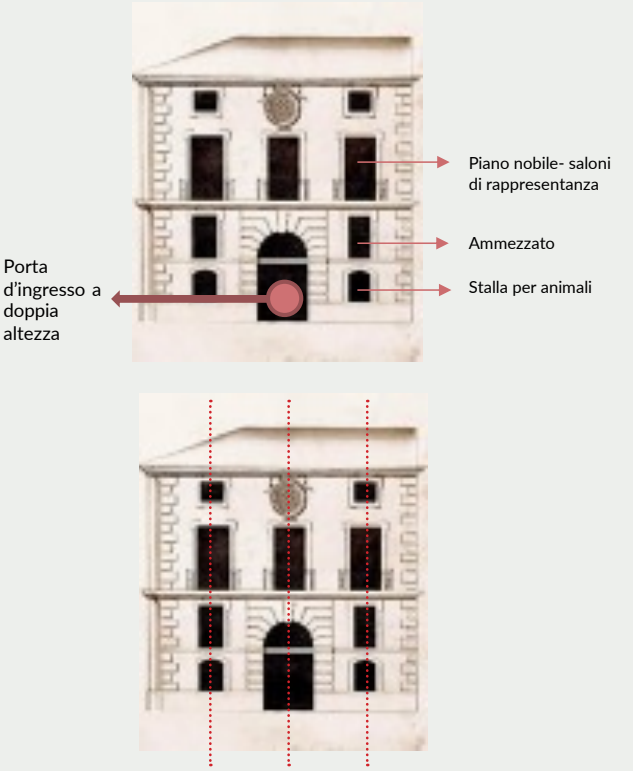




Geographical location	East of the Iberian Peninsula
Morphology	Flat with a low, sandy coastline; mountainous terrain to the west
Geographical division	Two large strips, one flat and one mountainous
Port	A port of great economic importance, a docking point for tourist ships and a commercial hub with the rest of the Mediterranean
Commercial connections	Wide opportunities for trade with port cities such as Italy, France, and Tunisia
Inner subdivision	34 comarcas, each with unique characteristics related to the landscape and local communities
Population	Approximately 5,005,737 inhabitants
Areas	685,43 km^2
Climate	Temperate, with an average annual temperature of 18.3°C
Temperatures	Minimum in January (11.9°C); Heat peaks in February (up to 40°C in 2024); Average temperature in August of 26.1°C to 30°C
Precipitation	Abundant in autumn, scarce in summer
Population of rural areas	1,001,147 inhabitants



RESIDENTIAL ARCHITECTURE



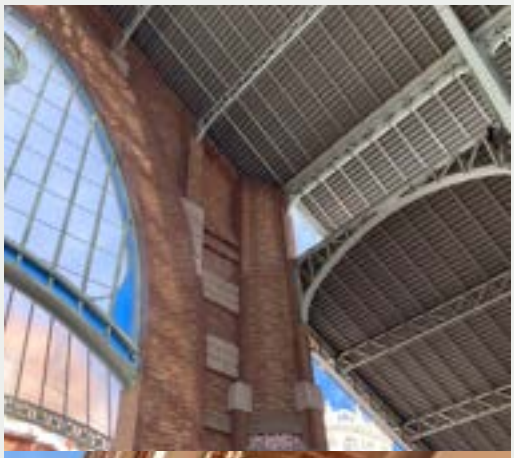
MONUMENTAL ARCHITECTURE

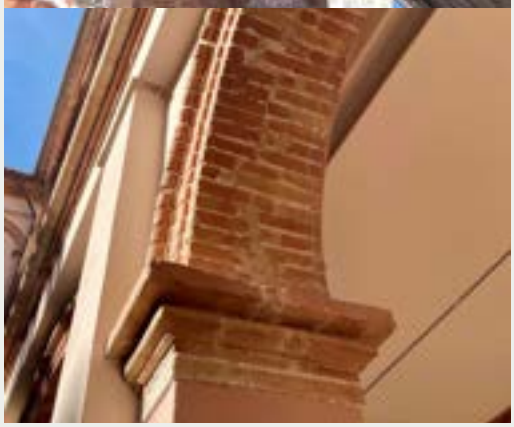
Although Valencia is now a city where modernity has driven cutting-edge interventions and constructions characterized by efficient and innovative technological solutions, the urban fabric still preserves a vast testimony of historical architecture, particularly in its fascinating historic center.

Here, the presence of architecturally significant buildings (*Fig. 1a*) is manifested in the skillful use of stone, which over the centuries has sought to replicate and sometimes enhance traditional construction techniques. The stone, expertly carved, not only recalls the building methods widespread in the area but also gives the buildings a timeless solidity and beauty. A distinctive element shared by many of the oldest constructions is the presence of large central courtyards (*Fig. 1b*), spaces that not only had a practical function of ventilation and lighting but also represented the heart of domestic and social life of the time (*Fig. 1c*), providing these buildings with a spatial and symbolic significance particularly relevant.

These examples of historical architecture, therefore, offer a striking contrast with the modern structures of the city, creating a dialogue between the past and the present that enriches the urban landscape of Valencia and reflects its deep historical layering.

CONSTRUCTION TECHNIQUES





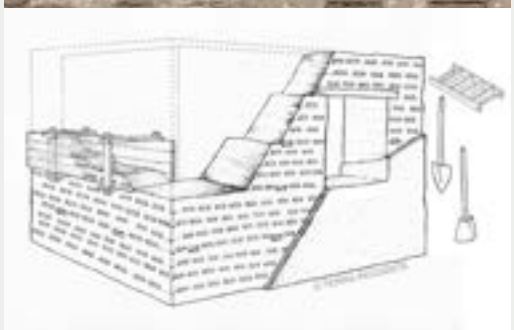
BRICK

Brick, due to its mechanical properties, has been widely used as load-bearing masonry in the construction of both rural and urban buildings. Fired clay bricks, arranged in orderly rows, were used to create massive and solid walls capable of supporting the weight of the structures above. This construction system, in addition to providing good mechanical strength, offered excellent thermal and acoustic insulation, which were particularly important in the hot climate of Valencia.

The use of load-bearing brick masonry characterized many traditional homes, as well as significant civil and religious buildings, demonstrating the versatility of this material.

Another crucial aspect of brick use in Valencia concerns its application in the construction of arches and vaults, key elements of Mediterranean architecture. Thanks to the brick's ability to withstand compression, Valencian builders were able to create arches and vaults that allowed the covering of large spaces without the need for beams or other vertical supports.

In particular, vaulted ceilings and round arches made of brick became a distinctive feature of the region's religious and civil architecture. The bricks, often arranged in precise and regular patterns, enabled the construction of monumental ceilings that offered both lightness and structural stability. This type of construction helped create spacious environments that were cool in the summer and cozy in the winter, in line with the climatic needs of the region.



TAPIA VALENCIANA

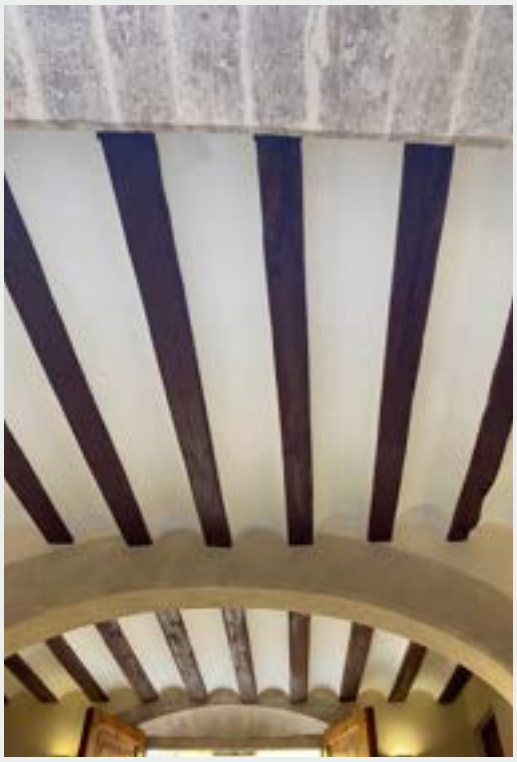
The *Tapia Valenciana* is a traditional construction technique used in the Valencia region, characterized by the use of local and natural materials, such as raw earth and lime. This technique is part of the broader Mediterranean vernacular architecture, where the use of rammed earth (tapia) responded to criteria of economy, sustainability, and climate adaptation.

The construction process of *Tapia Valenciana* involves the creation of walls using wooden formwork, into which a mixture of earth, gravel, lime, and sometimes small fragments of stone or ceramic is poured. This mixture is then compressed, layer by layer, through tamping, resulting in a solid and durable wall. Walls made using this technique offer excellent thermal insulation, keeping interiors cool during hot summers and protecting against thermal fluctuations in winter.

The *Tapia Valenciana* not only reflects a practical and sustainable construction method but also an important expression of the local building culture, deeply connected to the natural resources of the area. Even today, it is possible to observe historical earthen buildings in both rural and urban areas of the Valencia region, standing as evidence of ancient knowledge passed down through generations.

In recent years, there has been a renewed interest in the use of *Tapia Valenciana*, in line with the growing focus on sustainable construction techniques with a low environmental impact. Contemporary architecture has started to re-evaluate this traditional technique, combining it with modern materials and technologies to create buildings that respect both the environment and cultural heritage.

TECNICHE COSTRUTTIVE

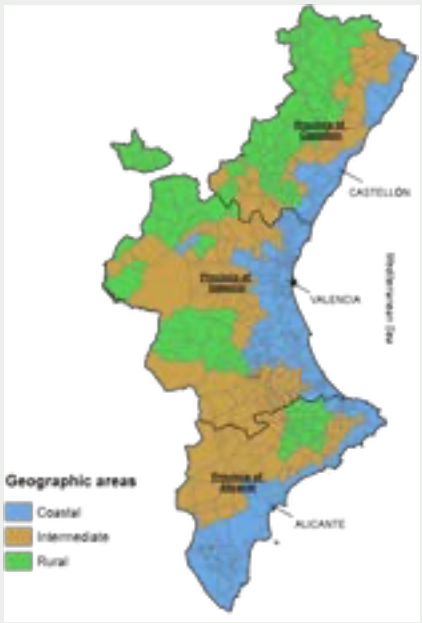


BOVEDAS TABICADAS

Among the techniques that best showcase ingenuity in the use of brick and stone are the *bóvedas tabicadas*. This technique, originally from Spain and widely spread in Valencia, involves the construction of thin and lightweight vaults using bricks. The great advantage of bóvedas tabicadas is their speed of execution and economic efficiency, as they allow for the creation of structures with few materials but high resistance. These vaults are particularly valued for their ability to cover large spaces without the need for complex reinforcement. The bricks are fixed with a fast-drying mortar, enabling quick and secure laying. This technique has been used for both religious buildings and private homes, where aesthetics and functionality were sought to be combined. The final result is an elegant and durable vault that, although thin, provides great structural stability.

This method proved particularly useful in rural houses, factories, and warehouses, where there was a need to cover large surfaces at low cost. The success of *bóvedas tabicadas* was so significant that, over time, Valencian artisans began experimenting with the use of carved stone instead of brick for vault construction. This evolution allowed the creation of even more resistant and durable structures while maintaining the lightness and elegance characteristic of this technique. Carved stone, in addition to ensuring greater longevity compared to bricks, gave the buildings a monumental appearance, especially appreciated in religious constructions and noble palaces.

PUEBLOS



The C*astellón* area, filled with Valencian pueblos, is located on the eastern coast of Spain, north of Valencia, and encompasses a rich variety of landscapes ranging from the innermountains to the Mediterranean coast. The province is known for both its coastal cities and its picturesque innertowns, offering a combination of history, culture, and natural beauty.
The province of *Castellón* can be divided into three main geographical areas (see *Fig. 1*):

- **Coast:** The coastal area faces the Mediterranean Sea and is known for its beaches and tourist destinations such as Benicàssim and Peñíscola, famous for its medieval castle overlooking the sea.
- **Central Area:** This region is home to cities such as *Castellón de la Plana*, the provincial capital, as well as a series of pueblos and historic smaller towns that combine rich architectural and cultural heritage with growing tourism development.
- **Mountainous Inland:** To the west lies a mountainous territory characterized by small medieval villages, nature reserves, and unspoiled rural landscapes. This area is particularly appreciated for hiking, rural tourism, and villages with a strong historical connection, such as *Morella, Culla, and Vilafamés*.

In addition to the *Castellón* area, the most authentic but also the richest in pueblos, the western portion of the Valencia territory, still not fully accessible, is characterized by numerous rural areas immersed in green and protected regions.

The *Setena* area, another area of study, consists of seven villages in the Tinença de *Benifassà* Natural Park, with a rich natural heritage, and has been considered for its similarities with the Madonie Park and its 21 villages, as well as the *Pereroles* Natural Park. Despite the population decline in some of these areas in recent years, projects for rehabilitationand energy efficiency are underway, including European programs and local initiatives to improve living conditions and accessibility. The presence of numerous castles in excellent condition attracts a large number of visitors daily, confirming monumental heritage as one of the main attractions of the pueblos, which are often well connected by transport such as buses and trains.

In addition to the pueblos, similar to the Madonie area, the rural territory of Valencia is characterized by unique rural architecture, such as the riurau, cascina, baracca, nevaio, and cebera, representing a widespread building heritage rich in traditions that shapes the Valencian landscape, contributing to a unique landscape closely tied to agricultural activities and local traditions.

This architectural affinity between Valencia and the Madonie Geopark in Sicily highlights the richness and variety of European rural traditions. Both regions, while maintaining their cultural identity, show an intrinsic connection between architecture and rural life, emphasizing the importance of preserving and enhancing this shared heritage.

The analogy between the Valencian territory and the Madonie helps in understanding the territory by recognizing in both areas, Madonie and Valencia, the possibility of comparison and a common principle of protection and enhancement.

RURAL ARCHITECTURE

Fig. 1 | RIURAU

Fig. 2 | CEBERAS

Fig. 3 | CASCINA

Fig. 4 | BARACCA

Fig. 5 | NEVAIO

The rural architecture of Valencia is characterized by a variety of structures that reflect the adaptation of agricultural communities to the climate, natural resources, and local economic activities. These buildings mainly address needs related to agriculture, livestock, and product preservation. Below is a technical description of some typical rural building types of the region:

1. Riurau: a traditional agricultural structure typical of the Valencia region, primarily used for drying raisins. Architecturally, it is an open building on one or more sides, supported by stone or brick arches, with a sloping roof generally made of tiles. The open design allows for good ventilation, which is essential for drying the grapes without exposing them directly to rain or intense sunlight. It represents a distinctive feature of the region's historical agricultural economy, particularly in wine-producing areas.

2. Ceberas: a traditional structure used for storing cereals and dried agricultural products. These structures are typically built with reeds or bamboo, with small openings to prevent the entry of moisture and animals. Their main function is to protect the harvest from weather conditions and pests while maintaining a dry and ventilated environment. Cebras are often integrated into masías or rural farmhouses, and their design reflects the focus on preserving foodstuffs in challenging climatic conditions.

3. Cascina: a multifunctional rural structure. It serves as both a residence for farming families and an operational center for agricultural activities. Architecturally, it is a large building, often constructed of stone or brick, with a double-pitched roof covered in tiles. Cascinas are structured on multiple levels: the ground floor is generally dedicated to animals and agricultural equipment, while the first floor houses the family's rooms. Cascinas represent robust agricultural architecture capable of accommodating multiple activities and adapting to the agricultural needs of the context. They are comparable to Sicilian farmhouses.

4. Baracca: a traditional structure very common in the marshy or coastal areas of the region, primarily used by fishermen or farmers. These are small buildings made of simple materials such as reeds, mud, and wood. The double-pitched roof, often covered in straw, is one of the distinctive features of the baraccas, which provide shelter from the elements with a minimalist architecture, connected to local natural resources. While simple, baraccas are deeply rooted in the rural and coastal landscape of Valencia, representing a sustainable way of life in harmony with the environment.

5. Nevaio: a building used for snow preservation, typical of the mountainous areas of the Valencia region, such as the Sierra Calderona. These structures were used until the 19th century to collect and preserve snow and ice during the winter, which were then used in the summer to preserve food or as a refrigerant. Nevaios are usually made of stone, with thick walls to keep inner temperatures low, and are equipped with openings to facilitate the storage and removal of ice. Architecturally, they are simple but ingenious buildings that use natural insulation to prolong snow preservation.

ACCESSIBILITY

Fig. 1 | Expanded Accessibility in Valencia ©Luisa Lombardo, 2023.

Fig. 2 | Underground Parking ©Luisa Lombardo, 2023.

Fig. 3 | Expanded accessibility in a tobacco shop in Valencia ©Luisa Lombardo, 2023.

Fig. 4 | Underground parking at Pça. de la Reina, Valencia ©Luisa Lombardo, 2023.

Valencia is a city strongly oriented towards accessibility, as both public and private urban spaces are designed to be usable by a wide range of users. In recent years, numerous interventions have been made to improve accessibility, including the conversion of stairs into ramps and the installation of urban elevators, which facilitate access to the many underground parking areas and help reduce the number of vehicles in the historic center. Although great attention is paid to compatible restoration, Valencia has sometimes sacrificed the coherence of interventions with the historical and architectural context in order to make the built heritage and city more accessible to a wider audience.

Accessibility has also been extended to monumental complexes, where stainless steel ramps have been installed to ensure access to Valencian cultural heritage. To facilitate visitor understanding, all museums and monumental complexes offer digital access systems via QR codes, providing information in various languages. Additionally, each complex is equipped with audio and textual aids for exploring monumental assets in more than five languages, including Valencian.

REHABILITATION STRATEGIES

1. RENHATA Plan (2020)
- **Description:** Energy rehabilitation and renovation plan for residential buildings.
- **Objectives:** Improve energy efficiency, reduce CO2 emissions, promote environmental sustainability, improve living conditions.
- **Target audience:** Residential building owners, condominium managers, tenants (with the owner's consent).
- **Eligible interventions:** Thermal insulation, replacement of windows, installation of efficient heating/cooling systems, accessibility interventions.
- **Incentives:** Grants, subsidized loans, tax deductions.
- **Application process:** Online application via the Generalitat Valenciana website.

2. PREE 5000 (2015)
- **Description:** Energy rehabilitation program for buildings in municipalities with fewer than 5,000 inhabitants.
- **Objectives:** Promote energy efficiency in areas at risk of depopulation.
- **Eligible interventions:** Improvement of thermal insulation, replacement of thermal systems with renewable energy sources, enhancement of energy efficiency in lighting.
- **Incentives:** Grants from 50% (thermal insulation improvement) to 20% (lighting).

3. IEEV.CV (Informe de Evaluación de Edificios de Viviendas de la Comunitat Valenciana) (2020)
- **Description:** Mandatory document for residential buildings that evaluates conservation, accessibility, and energy efficiency.
- **Validity:** 10 years.
- **Information:** Construction characteristics, conservation status, deficiencies, recommendations for maintenance and upgrading.

4. MIRA Platform (2023)
- **Description:** Platform aimed at promoting *best practices* in the rehabilitationof existing heritage.
- **Involved actors:** Entities, companies, architecture firms, universities.
- **Objective:** Contribute to the search for *best practices* in managing building heritage, validated by the authorities and technicians.

5. Energy Communities
- **Description:** Initiatives to create sustainable energy communities.
- **Incentives:** Grants, zero-interest loans, tax deductions.
- **Examples:** Active energy communities in El Cabanyal and Paterna, installation of photovoltaic panels on crematory ovens and ossuaries in the Valencia Monumental Cemetery.

6. Sustainability Governance
- **Description:** Collaborative initiatives on sustainability promoted by the City Council.
- **Involved actors:** Working groups, Aguas de Valencia Foundation, Visit Valencia Foundation.
- **Objectives:** Carbon footprint calculation, air quality improvement, restoration of natural ecosystems.
- **Recognition:** European Green Capital from 2024.

7. Architectural Innovations
- **Description:** Innovative interventions such as the extension of balconies using steel and wood structures, adhering to overhang restrictions (50 cm).
- **Example:** Implementation of green walls for air quality, use of smog-capturing murals.

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Fig. I | Views of Polizzi Generosa © Simone Carta, 2023

Chapter III

STRATEGIES FOR THE RECOVERY, SAFEGUARDING, AND ENHANCEMENT OF THE LOCAL TERRITORY THROUGH A SMART APPROACH

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Chapter III
Abstract

IT

Il terzo Capitolo della presente tesi propone una sistematizzazione delle strategie per il recupero, la salvaguardia e la valorizzazione del territorio delle Madonie, promuovendo un approccio *smart* che integra innovazione tecnologica e digitale con soluzioni per un'economia *green* e circolare. Attraverso l'adozione di strategie di innovazione sociale e la partecipazione attiva della comunità, il capitolo si prefigge di definire operativamente le modalità per la creazione di *Smart Villages*, coniugando tradizione e innovazione, integrando la comunità, la *governance*, il recupero del patrimonio costruito e la tecnologie insieme alla digitalizzazione. La ricerca individua soluzioni concrete e mirate, delineando un quadro strategico che include l'implementazione di tecnologie avanzate per migliorare l'efficienza dei servizi, facilitare la comunicazione e promuovere la sostenibilità ambientale incentivando l'uso responsabile delle risorse, supportano la produzione locale e riducono l'impatto ambientale.

In particolare, si propone, come strumento operativo, le Linee guida per il recupero e la valorizzazione del Comune di Polizzi Generosa, volto ad aiutare l'amministrazione, tecnici e cittadini nella comprensione dei caratteri identitari dell'architettura di base e nella proposizione di soluzioni tecnologiche compatibili.

L'approccio adottato sottolinea l'importanza di un coinvolgimento attivo della comunità nelle decisioni e nelle iniziative, così come delle altre componenti utili a fare funzionare il sistema proposto promuovendo la creazione di legami sociali e un'identità e una progettualità condivisa. Una volta individuate queste soluzioni, il capitolo mira a definire linee guida e *best practices* per l'attuazione del criterio *smart* nel contesto delle Madonie. Si propone la creazione di protocolli di gestione per gli *Smart Villages*, con indicazioni pratiche per implementare in modo efficace e sostenibile le soluzioni individuate.

E, infine, *business plan* specifici, per l'implementazione, il mantenimento e il monitoraggio delle soluzioni nel lungo periodo. In sintesi, il terzo capitolo costituisce il nucleo operativo della tesi, fornendo una guida pratica e dettagliata per la creazione e la gestione degli *Smart Villages* nelle Madonie, unendo visione innovativa, sostenibilità e concretezza applicativa.

EN

The third Chapter of this thesis proposes a systematic approach to the recovery, safeguarding, and enhancement of the Madonie territory, promoting a smart approach that integrates technological and digital innovation with solutions for a green and circular economy. By adopting social innovation strategies and fostering active community participation, the chapter aims to define the operational framework for creating Smart Villages, combining tradition and innovation while integrating community, governance, built heritage recovery, technology, and digitalisation.

The research identifies concrete and targeted solutions, outlining a strategic framework that includes the implementation of advanced technologies to improve service efficiency, facilitate communication, and promote environmental sustainability. This framework encourages the responsible use of resources, supports local production, and reduces environmental impact.

In particular, the chapter proposes Guidelines for the Rehabilitationand Enhancement of the Municipality of Polizzi Generosa as an operational tool to assist administrators, technicians, and citizens in understanding the identity characteristics of vernacular architecture and proposing compatible technological solutions.

The adopted approach emphasizes the importance of active community involvement in decision-making and initiatives, as well as the integration of other components necessary to make the proposed system function effectively. It promotes the creation of social bonds and a shared identity and planning vision.

Once these solutions are identified, the chapter aims to establish guidelines and best practices for implementing the smart approach in the context of the Madonie. It proposes the creation of management protocols for Smart Villages, providing practical instructions for effectively and sustainably implementing the identified solutions.

Finally, specific business plans are proposed for the implementation, maintenance, and long-term monitoring of these solutions. In summary, the third chapter constitutes the operational core of the thesis, providing a practical and detailed guide for the creation and management of Smart Villages in the Madonie, uniting innovative vision, sustainability, and practical application.

ES

El tercer Capítulo de esta tesis propone una sistematización de estrategias para la recuperación, la salvaguardia y la valorización del territorio de las Madonie, promoviendo un enfoque inteligente que integra la innovación tecnológica y digital con soluciones para una economía verde y circular. A través de la adopción de estrategias de innovación social y la participación activa de la comunidad, el capítulo se propone definir de manera operativa los métodos para la creación de Smart Villages, conjugando tradición e innovación e integrando comunidad, gobernanza, recuperación del patrimonio construido, tecnología y digitalización.

La investigación identifica soluciones concretas y específicas, delineando un marco estratégico que incluye la implementación de tecnologías avanzadas para mejorar la eficiencia de los servicios, facilitar la comunicación y promover la sostenibilidad ambiental. Este marco incentiva el uso responsable de los recursos, apoya la producción local y reduce el impacto ambiental.

En particular, se propone como herramienta operativa las Directrices para la Recuperación y Valorización del Municipio de Polizzi Generosa, destinadas a ayudar a la administración, los técnicos y los ciudadanos a comprender los caracteres identitarios de la arquitectura vernácula y proponer soluciones tecnológicas compatibles.

El enfoque adoptado subraya la importancia de la implicación activa de la comunidad en las decisiones e iniciativas, así como de otros componentes necesarios para hacer funcionar eficazmente el sistema propuesto, promoviendo la creación de lazos sociales y una identidad y planificación compartidas.

Una vez identificadas estas soluciones, el capítulo busca definir directrices y mejores prácticas para la implementación del enfoque inteligente en el contexto de las Madonie. Se propone la creación de protocolos de gestión para los Smart Villages, con indicaciones prácticas para implementar de manera eficaz y sostenible las soluciones identificadas.

Por último, se proponen planes de negocio específicos para la implementación, el mantenimiento y el monitoreo a largo plazo de estas soluciones. En resumen, el tercer capítulo constituye el núcleo operativo de la tesis, proporcionando una guía práctica y detallada para la creación y gestión de Smart Villages en las Madonie, uniendo visión innovadora, sostenibilidad y aplicabilidad práctica.

STRATEGIES FOR THE RECOVERY, SAFEGUARDING, AND ENHANCEMENT OF THE LOCAL TERRITORY THROUGH A SMART APPROACH

In the previous chapter, *Smart Villages* and policies for inner areas were examined, from national structural initiatives to micro-scale interventions, highlighting the tools supporting small communities and intervention strategies. Numerous studies in the area in recent years have attempted to explore the dynamics and processes related to small rural communities. These processes, as emphasized by Scoones, develop in two areas: that of policies and that of subsistence, where political choices can favor some groups and disadvantage others (Scoones, 2015). He also highlights the need to investigate the "black box" of institutions and public policies[1].

Fraser, on the other hand, emphasizes the importance of obtaining recognition and promoting participation to achieve citizens' emancipation, initiating a process of citizen empowerment (Fraser et al., 2003). Active participation in community life and the ability to claim political rights are essential for individual well-being (Chambers, 1997; Duflo, 2012). In this context, it is crucial to understand the role of local communities in recreating connections and projects. As highlighted by Chambers, communities are not only bearers of interests but co-creators of development, challenging the *top-down* approach that prevailed during the Fordist period (Chambers, 1983; Meloni and Uleri, 2021).

Following this line, Scoones draws on Chambers to outline a paradigm shift in rural development[2]. He asks: "*Whose knowledge truly matters? Which livelihood strategies are taken as models when formulating intervention policies?*" (Scoones, 2015; Chambers, 1983). It is with this perspective that the experimentation described in this chapter aims to delve into the micro-processes, working from within the communities to provide concrete responses to *governance*, and thus to inner areas, using innovative and sustainable approaches.

In recent years, the SNAI has promoted, albeit to a minimal extent, the protagonism of local communities, challenging the closure of some local realities that hinder innovation (Barca et al., 2014). The strategy assigns the local community the task of transforming its specificities into projects, enhancing the work of innovating actors who, although sometimes operating in isolation, are connected to supra-territorial networks. An analysis of the strategic documents approved until 2020 highlights how the word "Community" is central, although it takes on a romantic and idealized character, as emphasized by DeFilippis (2008). It is more about a new community than a pre-existing form, for which it is necessary to build "voluntary and open" processes capable of creating new identities (Manzini, 2018).

The definition of community by McMillan and Chavis (1986) emphasizes the importance of social bonds between different individuals engaged in common actions in local contexts. However, this definition does not explore the potential of communities in development processes. The literature presents two opposing views: one that celebrates the community as the center of social initiatives, and the other that criticizes its political effectiveness (DeFilippis et al., 2006). DeFilippis (2006) proposes a more nuanced understanding, seeing the community as a product of its broader contexts but also as an arena for social change. Thus, the community is seen as a political

[1] *"[...]the focus has been placed on issues related to power and politics, as well as the social and political relationships underlying them. This applies both to global processes mediated by national regimes and to the micro-political processes that govern relationships between different family units, as well as within each of them. These processes determine which survival strategies can be realistically pursued and which are, instead, ruled out from the outset. Therefore, it is essential to analyze institutions, organizations, and public policies from various perspectives. This means going beyond narrow economic approaches to analyze the social and cultural factors that drive people to act in one way rather than another and that influence the course of events, determining where and why they occur. [...]"* (Scoones, 2015).

[2] *"[...]there is an urgent need to "reverse" the thinking of development; why not turn it completely upside down? What would happen if we took seriously the challenges and stimuli coming from the real world? How would it be to look at the world through the eyes of a "farmer," a shepherd, a fisherman, a merchant, a street vendor, a laborer, or, to put it plainly, someone who, among the many activities commonly undertaken in rural contexts, engages in more than one at the same time? Surely, things would appear very different from what they are. [...]"* (Scoones, 2021)

space where significant change can occur.

Olivetti defines the community as the site of political elaboration and social mediation, an independent entity that does not require political parties (Olivetti, 2013). This approach, while radical, can be reinterpreted as a pragmatic response to contemporary challenges. Communities are not static entities but are capable of evolving and responding to needs, as highlighted by Cocco et al. (2019), and also creating opportunities in the territory. Experiences of community cooperatives and shared management of common goods, for example, often initiated by small groups, demonstrate how structured responses to local needs can be created, generating new perspectives in terms of relationships, job opportunities, but above all, social impact[3].

In Sardinia, community cooperatives were born in response to local challenges, with the support of municipal administrations, as in the cases of Fluminimaggiore and Ollolai (Mori and Sforzi, 2018); activities that are still not widely known or explored in Sicily. However, many policies continue to be imposed from the top down, with limited citizen participation, unlike in Europe, where the sense of community and activism for the regeneration of places are much more deeply rooted and create connections and projects.

Community cooperatives are just one of the many examples that can be undertaken at the local level, one of the many possible strategies for the rehabilitationand enhancement of small rural contexts.

Today, sustainability and the enhancement of smaller centers are priority objectives that a small community must approach. At the same time, it is also close to these goals because it operates in well-preserved and already inherently sustainable contexts. However, to face this challenge, it is necessary to redefine the "theory of value," adopting an approach that integrates the quality of the context, sustainable design, and technical, technological, and practical feasibility, so that economic, environmental, and social aspects are central to the territorial redevelopment and in synergy with the sustainable objectives of the 2030 Agenda.[4] (*Fig. 1*).

Smart Villages represent a transition towards rural communities that adopt digital technologies and sustainable solutions, improving quality of life and promoting economic, social, and environmental development. They aim to create synergies between cultural and natural heritage and innovation, enhancing the community through participatory *governance* focused on defining strategies and objectives that are balanced with the system in which they operate.

They are based on key principles such as inclusion, sustainability, and

Fig. III.1 | SDGs for Rural Areas ©Luisa Lombardo, 2024.

[3] The measurement of social impact is a complex process that aims to assess the change generated by an organization's activities on people's living conditions. The proposed process is divided into six linear stages that make the evaluation comprehensible for both profit and social organizations. The first stage involves defining the scope of analysis, which means establishing which aspects will be considered and which will be excluded from the evaluation, taking into account available resources and time. The second step concerns the mapping and involvement of *stakeholders*, which is essential to identify those who have a direct interest in the evaluation outcomes and gather relevant data from these groups. Understanding the process of change constitutes the third phase, in which the way the organization's activities have influenced the social reality is defined.

Next, in the fourth phase, the measurement and selection of indicators take place. In this phase, it is crucial to select metrics that accurately reflect the outcomes and impacts of the project. The fifth phase focuses on impact attribution, that is, determining the extent to which the observed changes are directly attributable to the organization's activities and not to other external factors. Finally, the sixth phase involves communicating the results and learning, with the goal of disseminating the evaluation results and integrating the lessons learned into the continuous improvement of future activities.

An important aspect to consider is the context in which one operates, as the evaluation of impact is influenced by external variables, such as the socio-economic situation of the beneficiaries or the presence of other organizations active in the same area. Moreover, to obtain effective results, it is necessary to determine whether the analysis will be predictive (ex-ante), conducted before the project begins, evaluative during the process, or ex-post, once the project is completed, to examine the overall effectiveness of the intervention. The impact value chain is a logical tool used to represent the link between inputs, activities, outputs, outcomes, and impacts, and helps monitor and understand how a project produces the desired changes.

In this process, resources and time are often key limitations that hinder the achievement of set objectives. Managing these constraints carefully, through accurate planning, allows optimizing the results of measurement and ensuring a reliable evaluation of the social impact generated. (Impronta Etica. (2016). Guidelines for Measuring Social Impact. https://www.improntaetica.org/wp-content/uploads/2016/08/Linee-Guida-Impatto_def.pdf [Last accessed: 13 September 2024])

[4] For the inner areas, in particular, refer to goals no. 7, 8, 9, 10, 11, 12, 13, 15, and 17, already outlined at the end of Annex N.2 "Atlases for technological solutions for the rehabilitation and enhancement of the inner areas of the Madonie Park."

innovation that respects tradition while looking to the future. These principles translate into practical actions such as the expansion of broadband, the digitisation of public services, and the use of advanced technologies like artificial intelligence and the Internet of Things (*IoT*) to optimise resource management and improve quality of life. *Green* and circular economy, local production, recovery, reuse, recycling, accessibility (both physical and digital), and *inclusive design* for resilient territorial development and intelligent, resilient communities (Delle Cave, 2024).

In addition, energy efficiency, seismic adaptation, and the analysis of the technical characteristics of historic buildings are fundamental themes for imagining and rethinking the basic infrastructure that characterises these small rural contexts. These priorities are highlighted, as an example, in the proposal of the Atlas and Guidelines for the Municipality of Polizzi Generosa and, by analogy or contrast, can be applied to other rural contexts.

Ensuring that the building heritage meets high living standards is one of the pillars of *Smart Villages*. Advanced technologies enable the reduction of environmental impacts from buildings and improve citizens' well-being by monitoring energy consumption in real time and contributing to the reduction of greenhouse gas emissions (Lombardo, Colajanni, Campisi, 2024).

However, all these activities prioritise tourism development, which remains one of the major pillars capable of generating economic income. The risk, however, is that it should not become the sole driver of the local economy but rather be integrated into a broader context of enhancing the territory's resources; this is to avoid phenomena of touristification that could erode the essence of well-preserved villages and contexts, such as the small innertowns.

Looking at the training process in the management of *Smart Villages*, it is therefore appropriate to follow precise steps and conduct an in-depth analysis of the territory, aimed at identifying the strengths, weaknesses, opportunities, and threats within the area. As done for the Madonie area, a SWOT analysis, questionnaires, and surveys allow for the precise identification of specific needs and opportunities for improvement in the local context. This preliminary phase provides a solid foundation for identifying priorities, needs, and resources present or necessary to develop a successful project. Alongside this, it is essential to promote interdisciplinary collaboration, involving professionals from various sectors, such as urban planners, engineers, economists, and sociologists, as well as universities and research institutions. A holistic approach integrates diverse expertise, ensuring that solutions are not only sustainable but also feasible in the long term.

Another crucial element in managing *Smart Villages* is the building of strong public-private partnerships. Collaboration between the public and private sectors allows access to specific expertise and strategic investments, contributing to the creation of a shared data system aimed at achieving common goals. This approach strengthens the capacity to implement innovative solutions and ensure the economic sustainability of the project. Guidelines, *best practices*, *business plans*, and management protocols, alongside regular monitoring, are other tools that a *Smart Village* must consider for development.

In this context, adherence to the principles of projects such as the National Rehabilitationand Resilience Plan (PNRR) is a priority. However, as with all European funds, it is essential to keep competencies up to date to respond to new dynamics and emerging needs, both at the community and global levels, going beyond the 2030 Agenda and the Green Deal, while considering the possibility of accessing as many funds and projects as possible to expand the range of potential solutions for the territory.

In well-preserved contexts (Association of Virtuous Municipalities, 2014), such as that of the Madonie, the enhancement and protection by institutions such as the Superintendence, extended to both historic centres and landscapes, serve as guiding principles for rural contexts within UNE-

SCO Global Geoparks or territories of great natural value, not only for the area but, above all, for humanity. These principles and processes, as well as the themes to be developed, ensure that every innovation aligns with protocols and regulations for the safeguarding of cultural and natural heritage, with a constant commitment towards sustainable solutions.

This varied growth path integrates advanced technologies with respect for tradition, projecting the territory towards a sustainable, inclusive future rich in new opportunities; it is not about being tied to the past, but rather about seeking to transpose and project it into the future.

The main objective that goes beyond the project of a *Smart Village* in a single Madonie village remains, however, the creation of a network of *smart villages*, an interconnected system that promotes sustainable development at the local level and, gradually, extends from the single municipality to the broader areas (Bobbio, 2004). At the heart of the future network vision is the creation of an exchange platform, where *smart villages* can share experiences, ideas, and solutions to replicate in other contexts, an ideal platform capable of providing the tools necessary for the protection and enhancement of territories. It is not about creating a Smart Village, but about promoting and contributing to the formation of united, collaborative villages that drive shared initiatives. Such a platform not only strengthens collaboration but also creates synergies between communities, fostering mutual learning and growth according to the principle that "together we are stronger."

Through this network, each village benefits from the *best practices* of others, but above all, each village, with its peculiarities, can contribute to filling the gaps of others, mutual aid and *co-design*, accelerating innovation processes and adaptation to local challenges.

A crucial element of this approach is the enhancement of the local ecosystem: each village is therefore encouraged to develop and support initiatives in line with the specific needs of its territory, its vocation, creating an environment in which innovation thrives and integrates organically into the social and cultural fabric without disrupting it. This approach ensures that technologies are implemented in a relevant manner, responding to local challenges, and that there are no forced or inappropriate solutions.

The proposed interventions are conceived as scalable models, adaptable not only to Sicilian realities but also to national and European contexts, respecting key principles and objectives in line with European Union policies. The proposed methodology aims at the widespread dissemination of the process of creating *Smart Villages*.

The discussion concludes by providing concrete support to the reality analysed, as well as to other contexts by analogy or contrast. Practical tools for the technological and compatible rehabilitationof the territory, as well as business models tailored for small municipalities, will be promoted to ensure conscious project planning. To conclude this journey, guidelines, *best practices*, *business plans*, and management protocols will ensure the sustainable development of territories.

All of these tools are meticulously described in this chapter with the goal of outlining a shared and pragmatic path for the development of *Smart Villages* in the Madonie context, following the parameters of protection and conservation, rehabilitationof existing heritage, and compliance with regulations. However, they must adopt a virtuous path and achieve goals as outlined in the provided diagram (*Fig. 2*).

In detail, in these months, a map has also been developed, inspired by representations of *Smart Villages* around the world, particularly in Sweden, and their representation method, identifying strategies and territorial opportunities that can help various contexts maintain a status of "relevance" by promoting territorial characteristics (Ahmadi, 2023) and a shared path where technologies converge in the sustainability process. This map has been tailored to the Madonie context, identifying different smart strategies to be applied for each municipality in the district, as in the guidelines for Polizzi Generosa.

The metro map (*Fig. 3*) developed for the Madonie *Smart Village* strategy is inspired by the traditional metro schemes found worldwide. Specifically, it unfolds in three distinct stages: firstly, it identifies the Madonie centres, mapping them accurately within the territory. Secondly, it connects these centres through a network of smart and technological paths, all oriented towards the central track of sustainability. Finally, for each theme, the map proposes a specific route to follow for achieving smart objectives. The points of intersection or intermediate stops represent the necessary stages to meet the defined parameters for *Smart Villages*; this is an initial approach to outline directions and paths to undertake and pursue.

Fig. III.2 | Strategies and Opportunities. ©Luisa Lombardo, 2024.

The figure specifically shows the 6 components to consider in order to achieve a Smart Village. In detail, each component plays a fundamental role in the development of the possible smart criteria for small municipalities like those in the Madonie.

Fig. III.3 | Smart Villages Map of the Madonie Park ©Luisa Lombardo, 2023.

The map provides a detailed graphic representation of the Madonie area, inspired by the famous London Underground map, to illustrate the connections between various municipalities and the strategies to be implemented in Smart Village contexts. Each line represents a specific area of intervention, linking the municipalities to technological, innovative, and sustainable goals. The green, thicker line highlights the central objective of sustainability, towards which all strategies converge, offering a clear and integrated vision of the actions to be taken.

Descrizione

Per integrare e adattare idealmente le esperienze di successo relative agli Smart Villages rilevate, è stata elaborata una rappresentazione grafica specifica per l'area delle Madonie, utilizzando la tecnica della "London Underground".
Tale rappresentazione, fondata sugli studi di caso analizzati, offre una visione chiara degli Smart Villages e delinea con maggior precisione tutti gli obiettivi a cui ambisce la ricerca.
Si propone, infatti, di collegare l'area delle Madonie a strategie tecnologiche e innovative da perseguire su diverse linee d'azione (ciascuna delle quali afferisce ad uno o più Comuni delle Madonie), tutte convergenti verso l'obiettivo primario, evidenziato con la linea verde e più spessa, della sostenibilità.

Legenda

Linea d'azione principale

Linee d'azione secondarie

Fermate = Steps da raggiungere

Intersezioni = Steps raggiungibili in collaborazione

NOME DEL COMUNE Comune afferete al Comprensorio madonita

SOSTENIBILITÁ

GOVERNANCE
LAVORO
ACCESSIBILITÁ
BUSINESS
SALUTE
MOBILITÁ
TURISMO
COMUNITÁ ENERGETICHE
SICUREZZA
DIGITALIZZAZIONE
ISTRUZIONE
FINANZIAMENTI

III.1 The stakeholders of a Smart Village

As outlined in the previous paragraph, the path to becoming a *Smart Village* is not simple and primarily requires the establishment of a system capable of supporting all subsequent steps. The concept of a *Smart Village* revolves around the integration of various actors who, with their complementary contributions, enable the territory to grow sustainably, enhancing existing heritage and responding to local needs through innovative and shared solutions.

Over the years, numerous opportunities have been offered by research worldwide on the perception and functioning of *Smart Villages* (Darwin et al., 2020). However, this research aims to focus on the importance of built heritage rehabilitationand the awareness that an integrated system of actors and solutions can serve as a model for creating a new type of Smart Village, based on the understanding that the integration of tradition and innovation can coexist and drive its perfect and balanced functioning, resulting in sustainable outcomes in both the short and long term.

To build a solid structure, it is necessary to have an organization that is equally effective and integrated. Therefore, it is useful to consider two fundamental spheres of intervention: the Social and Participatory Component and the Technological and Heritage Component. These two spheres reflect a dual approach, considering, on one hand, human capital and the active participation of the entire community, and, on the other, the use of advanced technologies, digitalisation, and attention to the recovery, enhancement, and protection of heritage.

Social and Participatory Component

The social and participatory component is the human and relational core of the Smart Village, crucial for fostering a sense of belonging and cooperation within the local community (Iaione et al., 2022). It is divided into two essential subcategories:

- **community:** The community dimension focuses on the active involvement of citizens in decision-making processes and in the daily life of the village/town. In this perspective, the community is not just a group of individuals, but a cohesive and collaborative social network (Armeni et al., 2021), where participation and cooperation are encouraged to strengthen the identity bond and generate a sense of collective belonging. In a *Smart Village* model, the community can and should be engaged through participatory tools or processes, or by forming cooperatives of any kind (energy or community-based), which, in addition to stimulating the local economy, promote a sense of ownership over shared projects and initiatives. These tools are essential for creating local employment, enhancing resources, and ensuring long-term sustainability;
- **governance:** *Governance* represents the coordination, administration, and management element within the Smart Village. It includes both local institutions and administrations, with its primary role being to facilitate transparent and constructive interaction with the community (Donato et al., 2017). Good *governance* is characterized by the ability to actively listen to the needs of the population and integrate local de-

mands into public policies. Transparency, inclusivity, and accountability are essential principles that guide *governance* actions, which should aim to build trust, strengthen social cohesion, and support economic and social activities promoted by the community itself. Essentially, *governance* represents the management of resources and strategic actions that make the development objectives of a *Smart Village* a reality. Moreover, *governance* has the role of identifying the needs encountered and translating them into projects and programmatic actions, both through European projects and any available tools.

Technological and Heritage Component

The technological and heritage component, on the other hand, focuses more on outcomes, the modernization of services, and the protection of architectural, historical, and cultural heritage, combining tradition and innovation to ensure that progress is in perfect harmony with local identity and compatible with the built heritage. This component is structured in the following areas:

- **technology and digitalisation:** The use of technology is a fundamental aspect for improving the efficiency and accessibility of public services and for facilitating communication and interaction between the community and *governance*. In the context of a Smart Village, digitalisation helps to reduce the gap between citizens and administration, allowing for more flexible and transparent management of resources. The integration of digital solutions, such as online platforms for accessing services or monitoring systems for managing environmental resources, contributes to optimizing resource use and improving quality of life. Similarly, technologies applied to the building heritage make the current building stock more relevant and aligned with contemporary needs. This technological approach promotes "*Smart Governance*," which leverages innovation to respond efficiently and sustainably to the needs of the local population.
- **rehabilitation and enhancement of material and immaterial heritage:** Another crucial aspect of the *Smart Village* is the rehabilitationand enhancement of heritage, which includes not only the protection of architecture and the conservation of local identity characteristics but also nature and intangible heritage (Alfonso Gonzales, 2018). The preservation and rehabilitationof architectural, historical, cultural, and environmental heritage help strengthen local identity, making the traditions and values of the territory an integral part of contemporary development (Donders, 2018). The enhancement of intangible heritage, such as customs, traditions, and traditional practices, is a key element in ensuring that technological progress is accompanied by cultural continuity (Mottese, 2019). This perspective enhances the authenticity of the territory and ensures that modernization does not compromise but rather enriches the local peculiarities and traditions.

The interconnection between these two components is not only desirable but absolutely necessary for the balanced and sustainable development of a Smart Village. The active participation of the community (Watson, 2010), supported by attentive and transparent *governance*, represents a solid foundation for the implementation of technological innovations which, in turn, contribute to improving the efficiency and quality of services, making life easier for residents. Furthermore, technology is functional to the protection of heritage: through monitoring and digital management systems, it is possible to protect and enhance architectural, environmental, and cultural resources (Carayannis et al., 2010), enabling them to be understood and shared, while ensuring that cultural, economic, and social growth is sustainable and respectful of local identity.

A *Smart Village* must, therefore, be understood as an integrated ecosystem, where technological innovation harmoniously blends with the enhancement of human capital and local heritage, creating a development model

that is inclusive, resilient, and able to respond effectively to the contemporary challenges faced by rural and inner areas. Within a Smart Village, the community plays a crucial role in the enhancement and protection of heritage, being the main party responsible for its conservation and promotion. Raising awareness and educating the local population are fundamental to ensuring informed and lasting engagement (Giuseppe, 2021). Through cultural initiatives, training activities, and workshops, the community is and must be informed about the importance of its heritage, promoting widespread awareness that encourages respect for and protection of local resources (Gould, 2018). At the same time, it is essential to encourage active participation from citizens in the design and implementation phases of initiatives (Micciarelli, 2022). *Co-design* mechanisms, as well as surveys and focus groups, allow the population to directly contribute to planning, bringing out needs, ideas, and proposals (Steen, 2013). This approach generates a sense of belonging and shared responsibility, motivating the community to care for the territorial heritage. The creation of community and energy cooperatives represents another tool to strengthen this process. These cooperatives allow for autonomous and shared management of resources, contributing to local economic development and promoting a form of social economy based on the very heritage resources.

In terms of *governance*, the development of protection policies is a key step in ensuring heritage preservation (Watson et al., 2010). Institutions, responsible for managing resources, must implement appropriate regulations, tools, and design support, encourage protection initiatives, offer financial support, and find the necessary funding to promote local enhancement projects. These policies aim to create an inclusive and sustainability-oriented regulatory framework in which heritage can be continuously protected and enhanced and receive subsidies for maintenance. Another central element is the collaboration between the public and private sectors, which enables the integration of external skills and resources in a sustainable and innovative management approach. The involvement of local actors and businesses provides new economic and technical resources, contributing to the success of enhancement projects, while constant monitoring and evaluation of initiatives allow the effectiveness of interventions to be analysed and improvements to be made. Through a transparent evaluation process, *governance* can document the impact of the actions taken, further encouraging the involvement of the community and local partners, as well as evaluating the support of universities and third-sector entities to improve the management of larger projects.

From a technological standpoint, the digitalisation of heritage represents an effective strategy to increase accessibility and promote direct and informed interaction with the public (Yu et al., 2024). The creation of digital archives, interactive maps, and dedicated applications are just some examples that allow the community and tourists to explore and learn about local heritage in an innovative way, transforming the experience into an immersive learning opportunity. Similarly, mapping and monitoring the heritage both environmentally and structurally using advanced sensors allows the preservation of architectural, cultural, and natural assets, anticipating potential damage from wear or adverse weather conditions and taking timely action on heritage (United Nations, 2023). Restoration and maintenance interventions on tangible heritage must respect traditional techniques and use local materials to ensure historical and cultural consistency while minimising environmental impact and preserving the authenticity of the heritage (Ashley et al., 2001). This type of monitoring reduces the need for invasive interventions, ensuring proactive and sustainable protection. The use of digital platforms for civic participation, in turn, helps facilitate dialogue between administration and community, making it easier for citizens to report issues, propose ideas, and participate in public consultations inclusively.

Finally, the enhancement of tangible and intangible heritage is the heart

of any intervention in a *smart village* context. The promotion of local traditions and skills is essential to keep the community's cultural identity alive, fostering the transmission of knowledge and practices to future generations through schools, workshops, and cultural events. These initiatives are just a few examples that strengthen the bond between the community and its territory, ensuring that local knowledge and skills can endure over time. Similarly, the creation of events and cultural routes represents an effective strategy to showcase heritage and attract conscious and sustainable tourism that respects and enhances local identity. By organising themed itineraries and dedicated events, heritage becomes not only a tourist attraction but also an opportunity to strengthen the community's sense of belonging (Rachele, 2022).

These actions, carried out in synergy by various *stakeholders*, foster the sustainable development of the Smart Village, where the community, *governance*, technology, and heritage itself integrate to promote effective protection of local resources. The result is a coordinated system that not only preserves the cultural and environmental identity of the territory but also generates economic and social value, building a more aware and respectful future rooted in its origins.

The next section will identify, specifically, the components of a Smart Village, along with their roles and responsibilities, as well as what is identified as the method for identifying a Smart Village.

Fig. III.1.1 | Petralia Sottana ©Letizia Cardinali, 2024.

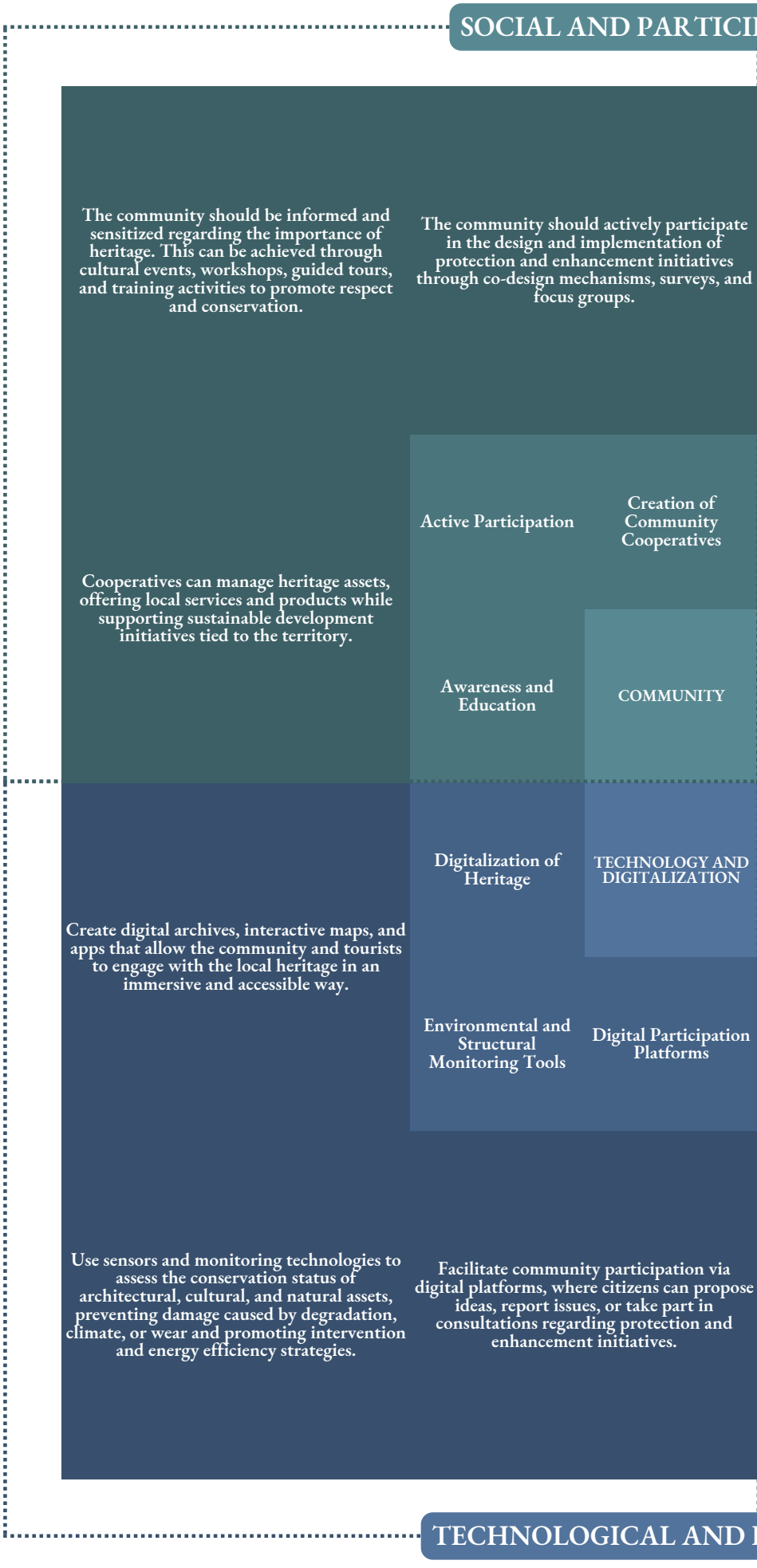


Fig. III.1.2 | Actors, themes, and operational indicators of Smart Villages ©Luisa Lombardo, 2024.

PATORY COMPONENT

Cooperatives can handle the management of heritage assets, offering local services and products, and supporting sustainable development initiatives related to the area.

Create partnerships with local actors and companies to promote heritage enhancement projects, involving external resources and expertise for sustainable and innovative management.

Development of Protection Policies

Public-Private Collaboration

GOVERNANCE

Monitoring and Evaluation

Governance should monitor the effectiveness of the actions undertaken for heritage protection, evaluating their impact and implementing continuous improvements.

REHABILITATION OF MATERIAL AND INTANGIBLE HERITAGE

Rehabilitation, Restoration, and Maintenance

Carry out rehabilitation and restoration interventions for architectural heritage, respecting traditional techniques and local materials, ensuring that interventions are sustainable and respect historical value.

Promotion of Cultural Events and Pathways

Enhancement of Local Traditions and Skills

Create cultural pathways and thematic events that can attract both local communities and external visitors, making heritage a point of reference and a sustainable tourist attraction.

Promote the transmission of local knowledge and practices through schools, workshops, and cultural events to keep local traditions and crafts alive.

HERITAGE COMPONENT

III.1.1 Smart Communities

The community represents the heart of a Smart Village, where active participation becomes essential to guide decisions in line with local needs. In this context, it is crucial to educate both the involved community and the one still to be engaged, understood as an integrated system of residents, tourists, and new inhabitants, towards shared values[1]. This education promotes the creation of shared projects, ensuring the permanence of both new and old generations in rural areas, a process that contributes to "restanza"[2].

It is important, however, to evaluate how the concept of community has changed today. One should not think of a settled community, but rather of a diversified community made up of residents, tourists, and also potential new residents, including migrants, who could bring great opportunities to the area.

Tools of participatory democracy generate ideas, projects, and induced tourism, and support economic management aimed at repopulating and revitalizing rural areas, not only to attract tourists (Scheyvens, 2002), but also to encourage a return to origins. Local participation, in fact, strengthens territorial identity, making local policies more robust. Involving the community in public consultations, *co-design*, and shared management of services ensures inclusive *governance* and planning that responds to local needs (Nyaupane et al., 2006). These participatory democracy processes bring economic benefits through management models focused on community well-being and cultural heritage enhancement (Garcia et al., 2018).

Participatory tools offer an effective way to engage the population in the planning and management of local resources and projects to be developed in the territory. Some concrete examples developed during the doctoral journey, in the case study of Polizzi Generosa, concern participation in the participatory democracy system and proposing solutions for the municipality, such as the implementation of green walls (*Fig. 2*) or the illumination of the characteristic "tocchi" of Polizzi, which not only offered *green* or technological solutions applied to the built heritage but also served as a reminder to raise the population's awareness and educate them about what can be done in local architectural heritage to recover and enhance it (*Fig. 3*). These processes allow citizens to express their preferences and actively contribute to defining priorities for territorial development, as well as create awareness and information, as happened with the Officine Sperimentali[3], an example already developed during the SNAI period, although not widely spread as a virtuous practice to implement.

In Italy, various communities have adopted this approach, aiming to promote flexible local development processes that trigger a growth dynamic rather than implementing individual projects. The *smart community* model offers a holistic vision of territorial development that integrates cultural, architectural, and environmental heritage with digital and technological innovation (Goodwin et al., 2009). This participatory context allows residents to take part in decisions concerning the environment and ongoing projects, whether under development or already completed. Through tools such as surveys and public assemblies, administrations can listen to and respond specifically to the needs expressed by the community, facilitating a participatory approach rather than a *top-down* one (Tricarico & Geissler, 2021). This method is particularly relevant in inner areas, where the aging population and geographic isolation pose significant challenges to the sustainability of services and infrastructure, requiring that projects be genuinely accessible to citizens and not imposed from above (Camagni & Capello, 2017). Participatory tools adopted in Amsterdam and Barcelona today involve citizens in strategic administrative decisions; members of the Cities Coalition for Digital Rights, along with Milan, launched this initiative in 2016 to promote and monitor citizens' rights.

Within this vision, citizens can become makers and/or k-makers (knowledge creators), playing a key role in the transformation process. Makers contribute their creativity to developing innovative solutions through *co-design*

[1] See, by way of example, the report The Role of Culture in Non-Urban Areas of the European Union, the result of the "Voices of Culture" project organised by the Goethe-Institut on commission from the European institutions, on the role of culture in non-urban areas of the EU. The project is an integral part of the "Structured Dialogue with Civil Society" outlined in the European agreements on the subject of culture, which aims to involve field experiences in shaping European policies that are closer to citizens, and meet the real needs of operators and cultural institutions. The report, presented at the end of April 2020, is a step in this process, which includes a selection of candidates on specific topics, in this case, culture in non-urban areas, their involvement in joint reflection sessions, the production of a report containing recommendations and policy indications, and a discussion in Brussels with decision-makers, namely the experts and politicians who formulate policies to support the cultural system. The text is available at the following link: https://ec.europa.eu/assets/eac/culture/docs/voices-of-culture/voices-of-culture-brainstorming-report-green-transition-2023_en.pdf.

[2] *I found myself, almost by chance, as happens in the magical unpredictability of writing, using, or inventing at least a new meaning for the word "restanza" (remaining). I did so in continuity and by association with terms such as wandering and distance. Because *restanza* does not denote a lazy and unconscious staying still, nor a mute and resigned waiting. On the contrary, it indicates movement, tension, attention. It requires fullness of being, persuasion, choice, passion. A feeling of traveling while walking, a continuous search for one's place, always in an attitude of waiting: always ready for displacement, open to change, and the sharing of the places entrusted to us. It is a sense of being in exile and foreign in the place where we live, which becomes the site for creating, with others, with those who remain, with those who return, with those who arrive, small daily utopias of change. To remain is linked to the painful and authentic experience of always being out of place, precisely in the place where one was born, lives, or feels one belongs. Perhaps there is no more radical disorientation, uprooting, than that of someone living exiled in their own homeland, fighting a daily battle, made of small gestures, to safeguard and protect the places that could be taken from them—not by outsiders, but by those who live there as if they were dead souls. The village and the community to be reached are not behind in time, but must be reached here and now, built day by day. Even with scraps, splinters, fragments—in the margins, in the peripheries—of the past (recognized and repaired) in a place so close and yet so far. Remaining means gathering the shards, reassembling them, rebuilding with old materials, retracing one's steps to find the path, seeing how alive what we thought was dead still is, and how essential what has been discarded by modernity is. It also means the will to look inside and outside oneself, to glimpse the beauties, but also the shadows, the darkness, the devastations, the ruins, and the debris. There is no room for*

*self-congratulation, self-aggrandizement, nor for affliction. *Restanza* involves rediscovering the beauty of stopping, of slowness, of silence, of a complex and tiring gathering, of being together. It is not a reflection in the spirit of "how beautiful it was once" or a kind of "utopian idealism of the past," nor an attempt to project into the past the ideal that is not lived in the present, nor a regret for a "good time gone," mythicized and never existed in the forms of many inventors of lost paradises. The traditional forms of conflict, rifts, and divisions within communities have disappeared or transformed into "narratives" to make way for new forms of conflict, or perhaps cohesion. The return-non-return must, therefore, begin with an in-depth analysis of what remains, with the awareness that the ancient ties evoked and lamented, the primary and solidarity relationships, whether real or imagined, have profoundly changed or no longer exist. It is the recognition that if a new community is possible and desirable where the old village once stood, this community must still be reorganized and invented, taking into account flights, abandonments, returns, and also changed forms of production and social relations. To remain means to create new modes of encounter, conviviality, and presence. If it is a conscious and ethical choice, remaining can never become closure or territory for artificial contrasts between those who left and those who stayed, between those who stayed and those who today arrive or return. Those who remain enhance the sense of traveling, and become a haven for those who return: perhaps because traveling and remaining, traveling and returning, are inseparable practices, finding meaning in one another. Those who stayed and those who left must give life to a dialectic that speaks of integration, of meeting, of separated lives, and of reconciliation. If it is true that even those who stay somehow feel they are traveling, it is also true that those who left somehow feel they remained. Those who stayed and those who left, without emphasis and without rancor, without that mix of hate and love, should perceive themselves in their similarities and their differences, linked to a particular life experience, a unique relationship with their place of origin and with other places. Remaining, then, is not a slogan or a proclamation. One can assert an utopia of small things that requires patience and care, circumspection and tenacity, attention and openness, a sense of responsibility, and discourses of truth that admit no illusions. It presupposes knowing how to identify where the spirit of Carnival, of reversal, of utopia blows, to escape from the places of new hunger and unprecedented fears: seeking a city, as dreamed of, that must recognize, make true, and inhabit its interior to dialogue with the world and open itself to it. The presepe village is finished, shattered, dismembered, exploded, emptied. Its shards have built new settlements, new worlds. Many of these shards return, profoundly changed, backward, in search of the lost body, which they will not find, in search of an impossible reconciliation and recomposition. But every return is a new beginning..*
(Il senso della restanza, Vito Teti, 2017)

[3] The experimental workshops of inner areas were not merely spaces for discussion and practices. In this way, the territory benefits from an active community that participates in the *co-design* and implementation of solutions, making local policies more effective, representative, and aligned with the needs of the area. Similarly, citizens are encouraged to identify local opportunities and understand possible steps to take independently in order to create new opportunities for themselves and, at the same time, create new opportunities for the territory. Involvement of citizens in the design and implementation phases of policies facilitates alignment between community expectations and sustainable development goals, contributing to inclusive and transparent *governance* (Buhalis, 2015).

Community cooperatives and energy communities, for example, represent essential tools for promoting social inclusion and strengthening social capital. Community cooperatives, often established in recent years, not only encourage the local economy but foster a sense of belonging and inclusion, mobilizing economic resources and skills for projects benefiting the community. These cooperatives, rooted in the local context, support the development of tourism, cultural, and environmental services, in line with the territorial vocation and local traditions, strengthening the link between the economy and active participation. Verbumcaudo in Polizzi Generosa is a virtuous example of resilience and opportunity in the Madonie area, turning a place once taken from the mafia into a site of production and activities for the region. They represent a bottom-up enterprise model where citizens participate in managing economic activities aimed at protecting and enhancing local heritage, promoting collective management of resources and services, with a long-term perspective that combines economic sustainability and social responsibility (Borzaga, 2019).

Finally, energy communities promote energy self-sufficiency by exploiting local resources for clean energy production (Lombardo, 2022). This type of project not only reduces environmental impact but also creates new economic opportunities for residents, allowing the community to directly benefit from the region's resources and contributing to sustainable development (Kumari et al., 2022); thus, they become both producers and users. The effective integration of these strategies into public policies demonstrates how community participation can support high-impact social, energy, productive, and economic projects, ensuring an improvement in quality of life and adequate protection of local heritage, as highlighted by the many opportunities offered by the Atlas (Lombardo, 2023).

In Sicily, the European project SIAS2[4], the *Summer School* in the inner Madonie areas of Isnello, Polizzi Generosa, and Petralia Sottana, engaged the population and youth in *co-design* practices and a participatory approach, addressing not only administrative needs but also local ones. This project demonstrated how community participation can inspire initiatives and projects tailored to the community, including social enterprises that create job opportunities, accessible social and cultural services, and civic participation in territorial planning; creative and training hubs, craftsmanship, and local production.

Agricultural cooperatives and local communities also emerge as solutions for agricultural, social, and economic sustainability and local food production, through resource sharing and direct sales of slow-food products, which are, in most cases, produced by locals using traditional practices. *Innovation hubs* and social factories represent collaboration spaces for developing new ideas and strengthening the local economy, not by creating ad hoc structures, but by considering the systematization of local resources to support possible activities to be launched. Sustainable tourism projects such as agritourisms and hiking trails, experiential and slow tourism, enhance natural and cultural resources, bringing economic benefits to rural communities. Training programs and skill development are essential for retaining residents in the communities and contributing to their development.

Starting design processes without active community involvement in management, administrative, and decision-making mechanisms risks depriving

exchange but also involved associations, economic and service operators, local administrations, and researchers active in inner areas. Their goal was to collaboratively define a limited and as precise as possible set of policies to be submitted to decision-makers in a timely manner for consideration in the new programming phase. Among the initiatives undertaken was the creation of the professional role of the community activator. This figure was tasked with the challenging responsibility of mapping and reallocating abandoned lands, facilitating access to real estate to promote territorial and site regeneration, providing training on environmental and local heritage, promoting energy communities, and launching initiatives to support and train individuals in the development of ideas, entrepreneurship, innovations, skills, and professions. Additionally, these efforts aimed to foster proximity services, promote a culture of participation, and ensure opportunities and spaces for social dialogue and engagement with public administration.

[4] Sicilian Inner Areas *Summer School* - N 2024-1-IT03-ESC30-SOL-000228603. Funded by the Italian Youth Agency & European Solidarity Corps. Project by GiN APS (Giovani IN APS) [see following subsection]

[5] Consider the "Bando Montagna" initiative by the Emilia-Romagna Region, through which approximately 700 young families have relocated to Apennine municipalities in recent years. They have benefited from regional non-repayable grants for the purchase and renovation of homes, along with free services to start or consolidate their professional paths locally. Similarly, the Metropolitan City of Turin is focusing on the "mountain demand" to initiate local development processes. Recently, a free consultation service was launched, providing access to mentorship and networking projects to build pathways for social and professional integration in inner and mountainous areas.

This initiative draws inspiration from the "InnovaAree" project, promoted by Collegio Carlo Alberto, Uncem, SocialFare, and funded by the Compagnia di San Paolo Foundation. Until 2019, the project supported entrepreneurial ideas from sixty social innovators and the aspirations of a hundred individuals aiming to change their lives and move to the inner and mountainous areas of Piedmont.

In Puglia, the regional program "Bollenti Spiriti" focused on activating young people and supporting their life and work projects to bring about a change in contextual conditions. This was achieved through access to low-threshold financial resources and specialized training opportunities for young people themselves.

the project of meaning for the inhabitants, who would not feel like an integral part of the initiative. This could create the perception of an external and imposed project, rather than one born from shared effort and commitment to their future.

The following paragraphs will analyze the methodology and strategies suggested to the local communities under study in order to create a foundation for the development and achievement of an Smart Village, based on a concrete experience.

Social entrepreneurship, when approached consciously and with the premise of sharing not only strategies but understood as a process that helps the community and, first and foremost, provides work opportunities in small rural areas, represents one of the most powerful levers to stimulate local participation and promote change in rural areas of Italy and Europe. It aims to foster commitment to social well-being and the resolution of community problems, positioning itself as an alternative to the mere pursuit of profit. Initiatives of this kind contribute to the creation of social, cultural, and environmental value, significantly improving the quality of life in local communities. Social enterprises, often managed by cooperatives, associations, or foundations, play a crucial role in local development through activities ranging from the production of goods and services to the management of common spaces and the promotion of cultural and social projects[5]. These organizations not only generate employment but also strengthen social cohesion and encourage active citizen participation, with citizens becoming true organizers of the community's operations. This community-based activity, rooted in the territory, relies on the ability to respond to local needs through sustainable and inclusive business models.

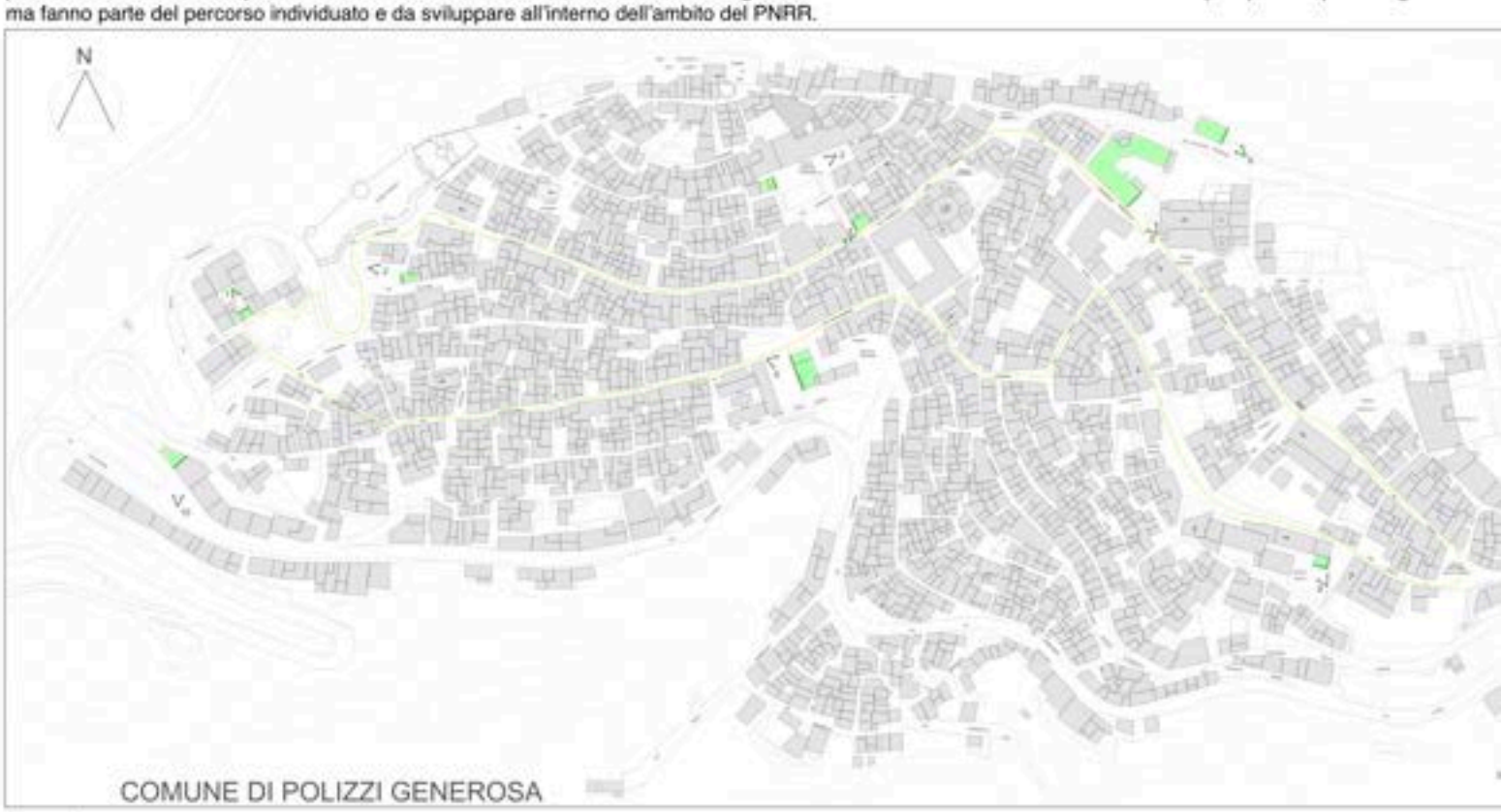
Two concrete examples illustrate these principles: the first involves the Verbumcaudo farm in the Madonie, acquired by the Sicilian Region and managed by the Verbumcaudo social cooperative, currently being redeveloped with funds from the National Rehabilitationand Resilience Plan (PNRR) for the creation of multimedia spaces, workshops for schools and youth, and energy requalification, with an investment of 5.3 million euros. The second case is the Borgo di Canistro, financed by the PNRR with 1.6 million euros for the “Dimension CRESCITA” project, which includes the rehabilitationof a deconsecrated church as a Cultural Hub, a building as an Infopoint and environmental education center, and the creation of an InnovationHub for the environment. The adoption of modern technologies such as Li-Fi and touchless totems enhances the local heritage, supporting slow and sustainable tourism.

These examples demonstrate how social innovation and local participation, within social enterprises, can significantly contribute to the enhancement and revitalization of territories. It is essential that such initiatives respond to local resources and actively involve the community in the decision-making process. Collaboration among different communities and the sharing of resources and knowledge represent a valuable contribution to the growth and well-being of inner areas, promoting a sense of belonging and mutual cooperation.

Fig. III.1.1.1 | The Polizzi community opens its monuments to visitors ©Michele Tumminello, 2021.

Benefici della parete verde, applicazione e rinverdimento:

Le pareti verdi, o giardini verticali, si delineano come elementi che manifestano un impatto positivo sul microclima interno degli edifici. Le specie vegetali svolgon fluttuazioni termiche, contribuendo all'isolamento termico mediante la creazione di un cuscino d'aria, rinfrescando l'atmosfera attraverso il processo di evap dell'irraggiamento solare e del vento, e garantendo isolamento acustico. I giardini verticali contribuiscono, inoltre, a mitigare le temperature nell'ambiente urbano, tipologia di giardini verticali che adotta l'inverdimento indiretto è ancorata alla facciata dell'edificio attraverso un'apposita struttura di supporto. Per un ottimale esposizi è sud-est, poiché a sud o a sud-ovest si ha una diretta e lunga esposizione ai raggi solari, con conseguente inaridimento del terreno. Un'esposizione a nord o nord-e di resistere anche in assenza parziale di sole. Gli interventi proposti mirano non solo al miglioramento del comfort indoor e outdoor, ma contribuiscono al migliorame o di edifici che fungono da "porte" di accesso al paese, il più delle volte costituiti da pareti cieche o semicieche. La scelta di questo intervento non è casuale, cons pensili, che evoca un luogo da sempre in stretto contatto con la natura. Essa funge da elemento per migliorare il decoro urbano e rendere più piacevoli i luoghi di in parte integrante di un processo di recupero e valorizzazione ambientale. Questo intervento è coerente con il percorso del PNRR "G.A. BORGESE GENIUS LOC preservare e valorizzare il patrimonio naturale e architettonico, contribuendo al miglioramento del tessuto urbano e alla creazione di spazi pubblici più accoglienti e sos ma fanno parte del percorso individuato e da sviluppare all'interno dell'ambito del PNRR.



Legenda:

- edifici interessati dal progetto di giardino verticale
- prospetti interessati dal progetto
- perco
- coni ottici di inquadramento di intervento
- 1< cortile Santo Spirito prospiciente casa G.A.Borgese orientamento nord-ovest
- 2< Piazza SS. Trinità prospiciente belvedere orientamento ovest
- 3< Piazza Barone Carpinello orientamento nord-est
- 4< Salita Carpinello prospiciente Via Garibaldi orientamento sud-ovest
- 5< Via Roma prospiciente Chiesa Madre orientamento sud-est
- 6< Via Giovanni Borgese prospiciente belvedere orientamento sud-est
- 7< Via Madonna delle Grazie prospiciente entrata est del paese orientamento nord-est
- 8< Piazza orienta
- 9< Piazza orienta
- 10< Via San orienta

o un ruolo fondamentale nell'attenuare le
otraspirazione, proteggendo dagli effetti
contrastando l'effetto "isola di calore". La
one alla luce solare, l'orientamento ideale
st, è possibile scegliendo piante in grado
nto del decoro urbano di luoghi di incontro
iderando la storia di Polizzi e dei giardini
contro e di aggregazione. Il suo utilizzo è
I", il quale promuove azioni finalizzate a
tenibili. Gli edifici scelti, non sono casuali,

rso PNRR

Turati , sagrestia Chiesa Santa Margherita
mento sud-ovest e nord-est

G.B.Caruso, Palazzo Postale
mento sud-ovest

nto Gagliardotto prospiciente entra ovest del paese
mento sud-est

Specie vegetali consigliate:

Solanum jasminoi
pianta rampicante sempreverde, dalla generosa fioritura di fiori bianchi a forma di stellades

Jasminum nudiflorum
pianta rampicante sempreverde, dalla generosa fioritura di fiori gialli

Clematis Montana Hybrida "Rubens"
pianta rampicante sempreverde, dalla generosa fioritura di fiori rosa

Muschio
pianta da inserire nel caso di pareti parzialmente rivolte a Nord

Caprifoglio
pianta rampicante resistente ai climi freddi

Dettaglio costruttivo

Sistema di fissaggio per rampicanti, mediante l'uso di reti elettrosaldate e geogriglie

Sistema di fissaggio modulare

Valutazione tecnico - economica

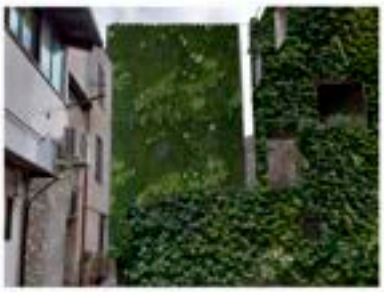
Costo: 200 €/ m2

Piante: autoctone sempreverdi, rampicanti o muschi

Sistema di irrigazione: a goccia

Sistema di fissaggio: mediante reti elettrosaldate per rampicanti o mediante moduli per piantumazioni a vaso reperibili in loco. Poichè la crescita verticale delle piante richiede un sostegno adeguato, vengono spaziano dall'uso di cavi tesi a grigliati, da facciate a doppia pelle a file di fioriere installate direttamente sulla parete. In ogni caso, indipendentemente dal sistema adottato, è essenziale mantenere una distanza tra la vegetazione e l'involucro edilizio per preservarlo da eventuali danneggiamenti causati dalle radici e dai germogli delle piante. Si predilige, tuttavia il sistema a cavi tesi grigliati o a facciate a doppia pelle.

Manutenzione: autonoma tramite irrigazione. La struttura movibile, facilmente smontabile e manutenibile, può essere costituita sia da piante naturali che da piante artificiali



Legenda:

- tocchi storici interessati dal progetto
- percorso PNRR

1. tocco di Cortile Santo Spirito
2. tocco sud di vicolo Notaro
3. tocco nord di vicolo Notaro
4. tocco di Vicolo Battiato
5. tocco di vicolo Glorioso
6. tocco di vicolo Donna Violanta
7. tocco di vicolo Riccobene
8. tocco di Vicolo Signorino
9. Chiasso Fatta
10. tocco di Vicolo Moschea
11. Chiasso di fronte Vicolo Caracciolo

DESCRIZIONE DEL PROGETTO

La Proposta di progetto tende a valorizzare i vari tocchi o chiassi
al led che ne valorizzi i passaggi e ne migliori non solo la visibilià
luoghi totalmente bui. Tali passaggi sono manifestazione dell'ant
urbanistici di stile ebraico, arabo o ancora importanti direttrici di
Il progetto vuole essere parte integrante di un processo di recup
il percorso del PNRR "G.A.BORGESE GENIUS LOCI", il quale promu
architettonico, contribuendo al miglioramento del tessuto urban

Il Progetto prevede l'intervento su undici luoghi del centro storic
quota della pavimentazione e su un unico lato per ogni Tocco.
E' previsto un costo di € 300 per ciascun Tocco.

FOTO DEI LUOGHI DI INTERVENTO PREVISTI

1 tocco di Cortile Santo Spirito

2 tocco sud di Vicolo Notaro

3 tocco nord di Vicolo Notaro, entrata inferiore

3 tocco nord di Vicol

5 tocco di Vicolo Glorioso

6 tocco di vicolo Donna Violanta

7 tocco di Vicolo Riccobene, entrata superiore

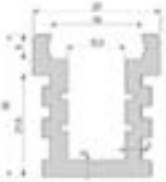
7 tocco di Vicolo Ricc

storici del Comune di Polizzi Generosa tramite un instalazzione di illuminazione
notturna ma anche la fruibilità degli stessi, essendo alcuni , allo stato attuale,
ica origine di Polizzi essendo nella maggior parte testimonianze di tessuti
collegamento verso manufatti storici di pregio.
ero e valorizzazione architettonica e culturale. Questo intervento è coerente con
ove azioni finalizzate a preservare e valorizzare il patrimonio naturale, culturale e
o e alla creazione di spazi pubblici più accoglienti.

o apponendo una striscia al Led ,incassata su un profilo metallico, posta sulla

ALCUNI PARTICOLARI COSTRUTTIVI

l'illuminazione tramite led verrà allocata in profili di alluminio.
Strisce flessibili e rigide fino a 12,3 mm di larghezza, Di facile installazione, il prodotto può essere facilmente tagliato in autonomia. Garantisce inoltre una protezione efficace delle strisce LED da fattori esterni e permette una loro maggiore durata grazie ad un sistema interno di raffreddamento passivo. Versione in alluminio naturale, lunghezza 2 m.



RIFERIMENTI PROGETTUALI

Varie vedute del Chiasso di Sant'Ansano di Santa Maria della Scala, Siena.

o Notaro, entrata superiore

4 tocco di Vicolo Battiato

9 Chiasso Fatta, primo tocco

9 Chiasso Fatta, parte interna del primo tocco

obene, entrata inferiore

8 tocco di Vicolo Riccobene, entrata inferiore

9 Chiasso Fatta, uscita del secondo tocco

10 tocco di Vicolo Moschea

III.1.1.1 SIAS2 - Sicilian Inner Areas Summer School

In the third year of the PhD programme, thanks to participation in European projects of the European Solidarity Corps in collaboration with the National Youth Agency, a *Summer School* dedicated to Inner Areas was launched. The project, titled Sicilian Inner Areas *Summer School* (SIAS2), project no. 2024-1-IT03-ESC30-SOL-000228603, was funded by the Italian Youth Agency and the European Solidarity Corps, under the auspices of GiN APS (Giovani IN APS).

Currently, small municipalities in Sicilian inner areas suffer from a lack of adequate professional skills, available technicians, and innovative ideas for development (Sagyndykova, 2021). Direct engagement with the challenges of the territory, involving local administrations and, crucially, the citizens, enabled a concrete analysis of needs and an understanding of the potential outcomes to be achieved. This led to the development of proposals and projects for the areas under study.

The main objective of the project was not only to bring a European Solidarity Corps initiative closer to our research experiences on inner areas but also to promote the recovery, protection, and enhancement of Sicily's inner areas. Particular attention was given to the territories of the Madonie and Sicani regions, while also extending the focus to Calatino, another inner area located in eastern Sicily, with an emphasis on promoting participatory democracy. A secondary aim was to foster dialogue between small Sicilian areas that are geographically distant, sharing results to circulate replicable ideas and projects. The *Summer School* was conceived as a practical tool for implementing the concept of *Smart Villages*, a central theme of the research. This concept found its first applications in the Atlas produced as a project output and in the Guidelines developed for the Municipality of Polizzi Generosa.

The *co-design* strategies adopted (Lepore, 2023) involved active participation from students, researchers, doctoral candidates, as well as the local community, associations, and administrations in examining the design choices to be made (Ellis et al., 2009). These *stakeholders* collaborated to analyse existing problems in the territory, transforming them into tangible opportunities and transferable solutions. By starting with the explicit needs of local administrations and conducting interviews as well as field design sessions, implicit and latent needs of the population were also identified. The main actors — administrations, citizens, students, and universities — collaborated to address four priority themes: Culture and Traditions, Branding and Tourism, Accessibility and Urban Aesthetics, and Services (Phillips et al., 2007; Jitea et al., 2018). For the area in question, these themes were considered alongside solutions outlined in the Atlas to systematise the European project, research, and on-site initiatives.

As a result of this collaboration, 16 projects were developed by teams for local administrations and communities, making both participants and residents fully aware of a feasible, concrete, and immediate future for their territories (Dimitra et al., 2022). These projects not only addressed the specific needs of the territory but were also designed to be transferable and replicable in other contexts using similar methodologies. Once the territorial vocation was understood, the projects were subjected to technical and regulatory assessments to verify their compatibility and feasibility in relation to the local heritage, with the aim of developing solutions that could be applied elsewhere. The *Summer School* demonstrated how the concept of "Smart," understood as intelligent and innovative, can align with initiatives that promote the integrated growth of the territory (Inzerillo et al., 2024). These activities facilitated the creation of collaborative networks among diverse *stakeholders*, aimed at understanding and analysing the territory, identifying the needs of its inhabitants, and developing specific and targeted projects. The initiative's primary goal was to promote a sustainable and resilient future for these areas, one that is human-centred and capable of addressing current challenges and meeting the needs of citizens.

Furthermore, in enhancing the built heritage for the development of the Summer School, territorial resources were taken into consideration from the outset (Lee et al., 2021). For example, the venues chosen for its activities included buildings made available by municipalities, museums, convents, and schools, which served as *Innovation Hubs*. These choices aimed to promote and enhance local resources while simultaneously raising municipal awareness of existing possibilities and identifying gaps.

The methodology adopted involved specific steps, including creative marathons and design sprints (Knapp et al., 2022), incorporating systems and procedures for the rehabilitationand enhancement of built and intangible heritage. These activities facilitated the rapid development of projects, supported by on-site engagement and dialogue with administrations and, most importantly, residents. The steps undertaken were as follows:

1. Kickoff: presentation of the administration and stakeholders, and assignment of the challenge
The kickoff is the inaugural event during which the local administration and the involved *stakeholders*, such as associations, citizens, and youth councils, introduce themselves and present the challenge that will guide the entire project. This moment proved to be crucial for outlining objectives, defining the operational context, and assigning the challenge to the relevant *stakeholders* and work teams. The aim of this step is to clarify the project's scope, expectations, resources, and potential constraints, while fostering a collaborative environment among all participants.

2. Icebreak: initial activities tailored to each municipality
The icebreak activity serves as an initial step aimed at fostering collaboration and trust among participants in the creative hackathon. This moment is designed to encourage interaction between team members, *stakeholders*, and the local administration, varying from one municipality to another to reflect the unique characteristics of the territory and local culture. It could take the form of group games, open discussions, or social activities, tailored to break the ice and promote communication and positive engagement within the working groups.

3. Consultation: systematisation and data collection of the municipality and the challenge
In this phase, the existing information regarding the municipality and the assigned challenge is systematised and collected. In addition to gathering pre-existing data, a new field survey is conducted to acquire further information that may be useful in addressing the challenge. This process allows for a clear understanding of the socio-cultural, economic, and environmental context in which the work is being carried out, as well as the specific challenges the project aims to resolve.

4. Interviews: site visit and initial interviews with stakeholders
The team then carries out several site visits in the municipality to better understand the physical and social context in which they are immersed. Subsequently, interviews are conducted with key *stakeholders*, such as local government representatives, entrepreneurs, citizens, and other influential parties involved in the project and its planning. The responses gathered are mapped to identify relevant quotes and *insights* that will inform the subsequent stages of the project. Additionally, a questionnaire is distributed to the citizens to collect quantitative and qualitative data on the opinions and needs of the local community.

5. *Proto personas* e *personas*: validation and development
In this phase, the existence of proto-personas is verified and validated, which are initial representations of user groups based on data and the first interviews. If necessary, new personas are developed, which are detailed represen-

tations of typical users that synthesise the needs, behaviours, and motivations emerging from the interviews. These personas will help the team focus the project on the actual needs of the end users.

6. From the challenge to the opportunity: turning the problem into a *design opportunity*
Every problem contains within it potential solutions. In this phase, the focus is on how the right questions can lead to great answers. A "*design opportunity*" is identified through the analysis of the assigned challenge, looking for *insights* that can give rise to innovative solutions.

7. Group brainstorming and rebrief
This phase involves an open discussion among the team members, during which the collected data is reviewed. An *insight moodboard* is created to summarise the ideas that have emerged, and a new *brief* (also called a *rebrief*) is drafted, clarifying the direction to take based on the new discoveries. This process helps to further focus the design objective, providing structure to the ideas for the next phase.

8. HMW (How Might We): design question
The development of the design question focuses on formulating the "How Might We" (HMW) questions. This phase involves structuring the *insights* that have emerged and helping to identify the critical points of the problem. The HMW questions allow for a positive rethinking of the project's limitations, turning them into opportunities for innovation.

9. Individual sketch: creative development in 4 steps
The *sketching* phase is divided into four distinct steps, which stimulate individual creativity:
Notes [10 min.]: Each participant notes down the main issues.
Ideas [10 min.]: Participants generate ideas on paper, without constraints.
Crazy 8 [8 min.]: Rapid development of 8 ideas in 8 minutes, to explore different solutions and open the mind to new paths and perspectives.
Solution Idea [12 min.]: Creation of a detailed *sketch* of the proposed solution, including a *brief storytelling* to illustrate the idea.

10. Decide and refine: selection and refinement of the idea
After the *sketching* phase, the team votes on the ideas proposed by each participant and selects the one(s) with the greatest potential in meeting the needs of the communities and all other entities involved in the design process. The winning proposal is then further developed and refined, incorporating any *feedback* that emerged during the discussion. Finally, a new, definitive, and improved *storytelling* is created, clearly representing the chosen design solution.

11. Pretotyping: development of pretotypes and simulations
A unique *sketch* of the project is created, and pretotypes are developed, representing preliminary versions of the project, product, or service to be delivered. These pretotypes can include *storytelling*, photomontages, or simulations that help test functionality and user understanding, serving to verify the compatibility of the proposed project.

12. Design Vision: defining the project vision
In this phase, the team defines the design vision, including the essential design principles, values, and elements of innovation. The uniqueness and replicability of the project are also considered, evaluating its environmental, economic, and social sustainability.

13. Prototype: creation of rapid prototypes
Each group develops a quick, "*throwaway*" prototype using prototyping te-

chniques and role-playing to simulate the use of the product or service. The prototype serves to make the design idea tangible and will be used in the testing phase.

14. Project test: identification of strengths and weaknesses
Tests are developed to assess the strengths and weaknesses of the project. *Feedback* is collected from videos, interviews, and direct observations of the prototype's use. This helps to understand the affordances and the user experience.

15. Presentation: final outcome
Two final results are produced:

- **Guy Kawasaki Presentation (10 Slides):** A concise and impactful presentation of the project idea;
- **Narrative Video:** A 30-second to 2-minute video telling the story of the project. AI tools can be used, but the use of local visual resources is required.

The approach adopted during the Summer School, which involved small contexts in the inner areas, demonstrated how the Sprint method is particularly effective in answering fundamental questions that entrepreneurs and leaders face daily regarding their initiatives. The creative marathons carried out showed that the ability to focus efforts on a crucial aspect and tackle it concretely is an essential element for turning ideas into reality. The Sprint, in fact, allows for the definition of quick solutions through prototyping and direct validation with community *stakeholders*, significantly reducing the time needed to obtain reliable answers. This process leads to tangible results in various sectors and is applicable to teams of any size, from municipalities and *startups* to large enterprises and non-profit organizations. Thus, the Design Sprint proved to be a valuable method for the inner areas as well, offering concrete tools for innovation and experimentation, with the goal of addressing local challenges quickly and with measurable impacts.

However, it is important to emphasize that this represents only an initial approach. To develop effective and sustainable projects and proposals, a process of deeper project development is necessary, including further analysis and reflection. Only through these steps will it be possible to arrive at more mature, optimized, and advanced solutions capable of addressing the specificities and unique challenges of each context.

Fig. III.1.1.1.1 | UTC Plenary Session ©SIAS2, 2024.

Fig. III.1.1.1.4 | Hackaton SIAS2 ©Luisa Lombardo & Samuele Morvillo, 2024.

III.1.2 Smart Governance

Governance plays a crucial role in *Smart Villages* (Abdulai, 2020), complementing the fundamental role of the community and integrating technology, participation, and sustainability to make public policies more inclusive, transparent, and effective. In a smart approach, administrations must be able to seize the opportunities offered by funding programmes to attract resources for local development. This approach is not limited to project planning but requires the integration of the population, which is essential for active participation in decision-making processes.

The use of digital portals is one of the main tools to encourage community engagement (Alsharif et al., 2010). These portals provide citizens with the opportunity to express opinions, participate in surveys, stay informed about local initiatives, and actively contribute to the design of public policies. In this way, participation is no longer confined to traditional forms of interaction but becomes continuous and accessible, even for those residing in remote areas. Digitalisation allows local administrations to gather real-time *feedback*, thus improving the quality of decisions and making processes more democratic and transparent.

Digital platforms are important not only in the participatory phase but also for systematising projects, proposals, and solutions aimed at promoting initiatives to be launched.

A notable example of this approach can be found in the *smart village* initiatives in Spain (Castellò, 2023), where some administrations in mountain regions have promoted a balance between technological modernisation and the preservation of local culture. Here, *governance* has facilitated the digitalisation of public services and created digital platforms that connect citizens with local institutions (Pazos-Vidal, 2022). The approach focuses on consultation and *co-design* with the community, enhancing the active role of citizens in decisions related to the territory and technological innovation. The case of Valencia also demonstrates how effective management requires considering the representation of interests related to sustainability and active citizenship. This approach sees rural areas as an integral part of a strategic plan involving the entire community, valuing rurality not as a periphery but as a fundamental resource (Gupta et al., 2017).

In *smart governance* (Donolo, 2020), digitalisation is a means of collecting and analysing data related to cultural, architectural, and natural heritage, creating databases accessible to all territorial actors for new projects. Some *governance* assessments might consider digitalisation, such as H-BIM for heritage, as done in Veberöd[1], Sweden, not only to start monitoring the heritage but also to track it and assess the impacts that certain technological solutions could undergo if integrated. Heritage mapping, in fact, allows for identifying underutilised resources and planning rehabilitationand restoration interventions that respect the local identity. Understanding the condition of buildings—whether completely outdated, partially recoverable, or already restored—enables more efficient heritage management, combining cultural enhancement, sustainability, and innovation. Technologies such as H-BIM, which catalogue heritage based on its historical significance, condition, and energy efficiency, provide an essential tool for managing and monitoring cultural and natural assets (Ebrahimbaysalami 2024).

Energy efficiency represents another crucial aspect of *smart governance*, applicable to both operational and disused buildings. The adoption of advanced technologies enables monitoring energy consumption and identifying areas of inefficiency, reducing consumption and optimising resources to benefit the environment and the local economy. Specifically, energy retrofitting of disused buildings, through participation in funding programmes, can transform unused spaces into resources for the community, with a positive impact on efficiency and sustainability.

In this context, energy communities represent a sustainable development model that reduces external energy dependence and promotes local autonomy (Lombardo et al., 2024). By bringing together citizens and busi-

[1] Smart Rural 27. (2024). Veberöd. Retrieved December 6, 2024, from https://www.smartrural27.eu/village/veberod/

nesses to produce and share renewable energy, energy communities promote efficiency and sustainability while offering new economic opportunities for the regions. These initiatives, often involving partnerships between local authorities, universities, and the private sector, are essential for implementing innovative solutions, improving service quality, and raising community awareness of responsible resource use.

A significant example can be found in Finland, where some rural villages have implemented a digital *governance* system that integrates information flows, energy resources, and tourism activities. This approach, characterised by close collaboration between the public and private sectors, creates an ecosystem capable of improving the quality of life for residents while respecting environmental heritage.

Access to European funds (European Commission, 2024) represents a fundamental opportunity to finance *smart governance* initiatives related to digitalisation, energy efficiency, heritage enhancement, and civic participation. However, to make the most of these resources, local administrations must have the necessary skills to draft effective funding proposals (Mack et al., 2020). This enables the implementation of innovative projects that improve the quality of services provided to citizens and promote a sustainable economic development model.

Furthermore, it is essential to highlight the importance of effective communication between *governance* and citizens. Broader dialogue fosters a sense of participation and facilitates the promotion of initiatives. Greater interaction implies closer collaboration and a higher willingness to undertake common activities, contributing to the perception of *governance* not as distant but as a reality close to and integrated into the lives of citizens.

Smart governance is based on the strategic use of technology to enhance the efficiency, participation, and sustainability of public policies. The digitalisation of decision-making processes, heritage enhancement, energy monitoring, energy communities, and access to European funds represent key tools for creating an inclusive and innovative territorial management model. This combination of elements fosters the development of resilient communities, ready to face contemporary challenges and build a sustainable future.

Fig. III.1.2.1 | The Mayor of Isnello, Marcello Catanzaro, opens the doors of the city to the participants of the Summer School ©SIAS2, 2024.

III.1.3 Rehabilitation and enhancement of tangible and intangible Heritage

If the community and *governance* play a decisive role, architectural heritage, although not considered an active element of the territory, passively constitutes one of the fundamental aspects to be considered (Claval, 2012). Heritage, both tangible and intangible, is a key resource for local communities (ICOMOS, 1999), as it represents not only the historical and cultural memory of a territory but also a potential tool for economic and social development (Sardaro et al., 2021).

Regarding intangible heritage, digitisation emerges as one of the most powerful tools for enhancement and management, as it allows for the collection, preservation, and dissemination of historical, artistic, and cultural information in a manner that is accessible and usable by a global audience. The creation of digital archives, virtual museums (Yang et al., 2021), and interactive platforms, as well as the ability to experience heritage through virtual and augmented reality, not only preserves it but also makes it accessible in innovative ways, expanding the reach to a broader and more diverse audience (Yang et al., 2023). The digitisation of local traditions, crafts, and oral languages contributes to preserving and promoting cultural identity by collecting testimonies and traditions that might otherwise be lost.

The promotion of events, festivals, and fairs related to local tradition and culture supports this process and represents another crucial aspect for the enhancement of intangible heritage, particularly for slow tourism (Brunoti et al., 2022). Such events can, in fact, not only enrich the town but also create opportunities for vitality and rediscovery of local traditions. These events, which celebrate gastronomic, artisanal, and folkloric traditions, provide unique opportunities to engage residents and attract visitors who are sensitive to authentic culture and sustainable tourism. Through careful and targeted management of these events, communities can stimulate the local economy, promote active citizen participation, and raise awareness of a type of tourism that is more respectful of the environment and local traditions (Salemink et al., 2017). Furthermore, slow tourism (Moscarelli et al., 2023), as mentioned in the introduction to this chapter, allows for the in-depth discovery and appreciation of the distinctive features of a territory, showcasing its territorial vocation, reducing the impact of mass tourism, and offering more authentic and immersive experiences. This is why tangible and intangible heritage are in perfect synergy; popular and religious events could, in fact, trigger virtuous mechanisms for the rehabilitationand enhancement of the built heritage.

As for tangible heritage, the protection and enhancement of the built heritage requires a more technical and structured approach that can ensure the conservation of architectural heritage without compromising its historical and cultural value (Galderisi et al., 2021). To this end, the adoption of manuals, guidelines, atlases, and practice codes becomes essential for managing traditional architecture and historically significant architectural sites, such as well-preserved small urban contexts (Onesti, 2021). First and foremost, this allows for understanding how to intervene while simultaneously spreading and promoting sustainable and compatible rehabilitationpractices. These tools provide precise guidelines on how to intervene in a conservative and respectful manner, promoting rehabilitationinterventions that are both effective and compatible with sustainability (Borri et al., 2001). This is what is foreseen by the latest law of the Sicilian Region, which requires that the new PRGs to be approved in the next five years include supporting documents for interventions on heritage. The conservation of the built heritage is not merely an aesthetic matter but one of respect for the historical, architectural, and cultural identity of a place, and must therefore be guided by principles of good practice that are consistent with protection regulations and community needs. The examples of Polizzi Generosa and the Madonie sector, developed for this doctoral thesis, represent two key strategies for understanding how to intervene on the local architectural heritage.

Strategies for repurposing existing heritage represent another area of great importance, especially in the context of sustainability and social innovation. If *governance* and the community are aware of the potential of the territory, they can also be equally proactive in managing resources consciously, evaluating the opportunity to give new life to them (Pinto, 2004). Rebuilding, recovering, and giving new functions to these resources can create new work opportunities for the area. In this context, projects such as ecovillages (Gilberto, 2012), eco-sustainable accommodation structures, and co-housing for those over 65 are examples of how built heritage can be creatively reused, maintaining its original functionality but adapting it to modern needs. Ecovillages, for instance, offer housing solutions based on ecological principles, creating self-sufficient communities that promote the use of renewable energy and responsible management of natural resources, as well as the practice of rehabilitationby emulating local construction techniques and promoting traditional buildings. Likewise, co-housing for those over 65 responds to a growing social need, offering shared living spaces that promote intergenerational integration, mutual care, skill exchange, and, ultimately, the well-being of elderly citizens in these small contexts.

Finally, creative and *innovation hubs* for the local community play a crucial role in fostering economic growth, creativity, and social innovation. These spaces, which can host artists, start-ups, and social enterprises, provide opportunities for training, networking, and development for those wishing to launch innovative or cultural projects. By creating innovation centres and incubators for ideas, local communities can stimulate the production of added value in key sectors such as digital craftsmanship, sustainability, and technology, with a positive impact on the economic and social fabric, while also developing strategies and pathways for the enhancement of the territory. Creative hubs not only promote employment and integration but also contribute to a cultural and social transformation, where the community becomes actively involved in defining and realising its future development.

The enhancement of tangible and intangible heritage through digitisation, the promotion of cultural events, the protection of built heritage, reuse strategies, and the creation of creative hubs represents a set of practices that significantly contribute to the sustainability and growth of local communities. These approaches, when integrated into a coherent territorial development plan, not only preserve and promote cultural identity but also stimulate social and economic innovation, creating a balance between tradition, modernity, and sustainability.

In the context of the thesis, a useful approach to promoting the rehabilitationand enhancement of local architecture was the development of a tool such as the Guidelines, designed to support the conservation of built heritage and to promote knowledge of tools, technological solutions, and innovative methodologies applicable to the local heritage of the Municipality of Polizzi Generosa. This tool aims to raise citizens' awareness of an integrated development model, based on the collection and systematisation of past activities and research to enhance traditional architecture and encourage a conscious and sustainable approach to territory recovery.

The Guidelines represent a reference to guide interventions compatible with the peculiarities of rural and urban contexts, taking into account material, cultural, and landscape specifics. Moreover, through the adoption of new technologies and the promotion of collaborative practices between local communities and administrations, the tool aims to enhance the territory's capacity to adapt to changes while preserving the authenticity and cultural identity of the places.

A central aspect of this approach is the active involvement of local communities, encouraging direct participation in decision-making processes and fostering constructive dialogue between experts, administrators, and citizens. This dialogue not only promotes greater awareness of the value of built heritage but also helps define shared strategies for its recovery, safe-

guarding, and enhancement, with a focus on sustainability and innovation.

Through the Guidelines, which will be addressed in the following section, it is hoped to stimulate an integrated management model capable of combining tradition and modernity, transforming local heritage into a dynamic resource for the economic, cultural, and social development of the communities.

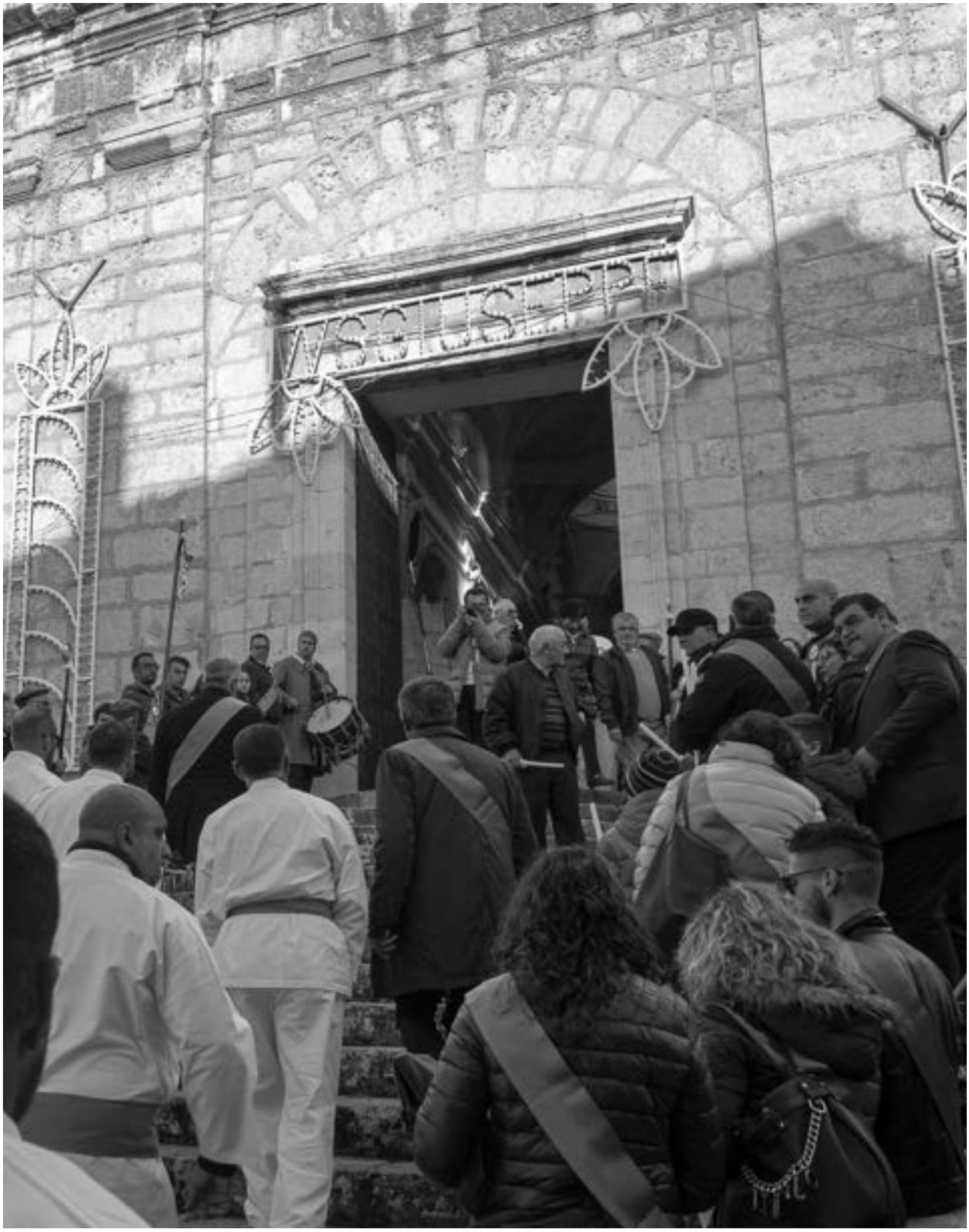


Fig. III.1.3.1 | Procession of Saint Joseph in Polizzi Generosa ©Michele Tumminello, 2022.

III.1.3.1 Rehabilitating madonita vernacular architecture. Guidelines for Polizzi Generosa

In order to systematise the research conducted in Italy and abroad, in collaboration with the corporate tutor from the Palermo Superintendence of Cultural and Architectural Heritage, Arch. Delia Geraci, it was decided to develop, during the period abroad, a restoration manual, called guidelines, for the historic centre of the Municipality of Polizzi Generosa, identified as a pilot case for the Madonie area, and attempt to systematise the Valencian methodology, considered smart, related to the restoration manuals for smaller towns. This represents the result of the collaboration between the Superintendence of Cultural and Architectural Heritage of the Province of Palermo, the Municipality of Polizzi Generosa, and the support of the Technical Office of the Municipality of Polizzi Generosa.

The conservation and restoration of historic centres are primary objectives for preserving the cultural and architectural heritage of Valencia. For these efforts to succeed, it is essential to create accessible, concise, and intuitive manuals capable of guiding both experts and the public through this complex process of restoration and conservation.

This approach has been observed multiple times in rural contexts:

- *Renovar conservando. Manual para la restauracióm de la arquitectura rural del Rincón de Ademuz* di Vegas F. e Mileto C., 2007
- *La arcuitectura popular de Peniscola. Manual de restauracion del centro historico* di Balaguer P. e Vicen L., 2011
- *Patrimoni arquitectònic de Benicarló. La memoria compartida.* di Aicart Queralt J.M., Onda Edicions, 2020
- *Manual de Buenas Prácticas Constructivas del centro histórico de Borriol* di Arquer N., Linares J.C., Palmer J., 2020
- *Rehabilitando El Cabanyal. Un recorrido arquitectónico por el barrio de El Cabanyal* di Mileto C. e Vegas F., 2023

Manuals considered smart for the conservation and restoration of Valencian historic centres, as they combine clarity, accessibility, and a strong visual component. They are effective tools for guiding the restoration and conservation of one of Valencia's most precious cultural heritages in an intuitive and accessible way for all. This awareness also arises in light of the numerous books on the restoration and enhancement of territorial contexts that have been developed over the years for the Italian case.

The analysed volumes, in detail, open with a description of the historical and cultural context of the towns. This is followed by a description of the region's traditional rural architecture, the restoration and conservation techniques for rural architecture, which include the repair of damages, the replacement of missing elements, and both routine and extraordinary maintenance. They conclude with a series of recommendations aimed at identifying future actions to be undertaken and the methods through which these can be carried out. These include the need to involve the local community in the restoration process, the need to use traditional materials and techniques, and the necessity to ensure that restored buildings are used sustainably.

The key characteristics that make these effective are:

- **clear and modular structure:** a smart manual for the conservation and restoration of historic centres should be structured logically and modularly. Each section should address a specific aspect of the restoration process. This structure facilitates the consultation of relevant information;
- **simple and accessible text:** the language used should be simple, avoiding complex technical terminology. Explanations should be concise and easily understandable by anyone, regardless of their level of expertise in the field. A concluding glossary ensures the understanding of terms that may be too complex or localised, and therefore not easily comprehensible to all;
- **bundance of images and graphics:** images, maps, diagrams, and charts are essential for illustrating concepts clearly and effectively. Befo-

re-and-after photos/renderings of restoration interventions can visually demonstrate the effectiveness of the strategies;
- **practical examples and case studies:** the manuals should include numerous practical examples drawn from real conservation and restoration experiences of historic centres, as well as good practices observed in other territorial contexts. These examples can show how strategies can be successfully applied and provide inspiration;
- **additional resources:** a section dedicated to additional resources, such as websites, technical documents, support organisations, and useful contacts, can provide further information and practical assistance. Promoting accessibility is also important;
- **highlighting successes and positive outcomes:** emphasis should be placed on examples of success and positive results achieved through the conservation and restoration of historic centres. This can motivate and inspire local *stakeholders* and communities;
- **visually appealing design:** the manual should have a visually appealing design with a clean and well-structured layout to create an environment of study and analysis that is as clear and user-friendly as possible. Images should be of high quality and well integrated into the text, as well as appropriate to the type of idea, solution, or analysis being addressed;
- **digital accessibility:** to reach a broader audience, the manual could be available in digital format, accessible on mobile devices and computers, making it easier to consult on-site during restoration works as well as in advance, during the design phase.

The guidelines for Polizzi Generosa have therefore been created by reworking the structure proposed here and applying the methodology encountered in the study of supporting documents. The significance of these territorial contexts, such as small innervillages, is evident both at the territorial and architectural scales. Elements such as arcades, streets, city walls, buildings, and common structures in both the Madonie and the Valencian area, as well as palaces, rural houses, castles, monastic complexes, churches, convents, and public buildings enrich the beautiful Madonie landscape, making it unique. The investigation undertaken is both historical/critical and historical/technical. The analysis of basic architecture and the previous research study related to the theme examines the local construction lexicon to identify possible restoration interventions while respecting the historical integrity of construction techniques. A unified and operational understanding of the territorial context aims to preserve and enhance the village as a whole, configuring compatible land uses and technological solutions with the existing building heritage.
The objectives of the Guidelines are:
1. promote sustainable development that integrates the needs of preserving historical and cultural heritage with the requirements for modernisation and technological innovation;
2. ensure the safety and well-being of residents through interventions that adapt the built heritage to the local construction tradition;
3. encourage active participation from local communities in the understanding of architectural heritage, as well as in the planning and implementation of restoration projects;
4. strengthen the economic and social resilience of inner areas by supporting the enhancement of local architecture;
5. effectively utilise community and national funds through transparent *governance* and careful financial planning, ensuring the maximisation of the impact of available resources and the respect for architectural heritage.

The landscape and archaeological constraints present in Polizzi Generosa represent project opportunities, and in this case, the restoration is conceived as a starting point that provides an overview of traditional construction techniques for a critical understanding of the artefacts, but above all, for

operational purposes. It is said, indeed, that we must "know to preserve," with the goal of creating professionals dedicated to conservation in order to avoid underestimating the past and prevent any kind of artistic liberties. This provides practical operational outcomes and helps identify, outright, the most suitable path to follow.

In the 1980s, Paolo Marconi identified the history of architecture as the history of construction techniques, considering a multidisciplinary approach to be the most appropriate. The guidelines are not static but provide a dynamic and open vision of the built heritage.

They are not a mere description of architecture but rather an upgrade of what has already been done in recent years of research in the Madonie area. They offer operational outcomes to be developed in order to conserve and protect the present heritage, considering not only the village but also the landscape and isolated assets scattered across the territory. These elements all stem from the same design, compositional, and construction roots. The methodology pursued follows an approach similar to the Valencian manuals, involving the study of the architectural features present, while introducing the operational aspect made up of solutions and design choices to be applied to the Polizzi Generosa case study.

The innovative component lies in the screening of inconsistencies within the architecture based on the principle of contextualising the artefacts, a feature widespread in the Madonie, and which constitutes an important step for conservation processes and, therefore, for the rehabilitationand enhancement of the areas. This perfectly combines tradition and innovation in a smart manner. The manual is initially focused on the analysis of the basic architecture of the Madonie region and the architectural features

Fig. III.1.3.1.1 | Methodology and Development of the Guidelines for the Municipality of Polizzi Generosa ©Luisa Lombardo, 2024.

in the Polizzi Generosa context, examining all the peculiarities of the built heritage, offering an overview of past work. It then defines the parameters necessary for maintaining urban and architectural decorum, using the traffic light technique—yellow, red, and green—to highlight all the inconsistencies present and find a solution for the rehabilitationand enhancement of the village.

Further practical examples of technological solutions found in the Madonie area, as well as in the Valencian context, are also provided. Finally, the last part of the guidelines includes recommendations on accessibility and the furnishing of bars and kiosks to establish directives for the rehabilitationof the urban context.

At the end, a glossary is included to assist "non-experts" or emerging technicians who may not be familiar with certain technical terms, helping them understand the Sicilian vocabulary related to the restoration of architectural heritage typical of the Madonie area. Starting from the guidelines developed for the municipality of Polizzi and following the same methodology, it will be possible to initiate a virtuous process for creating further manuals for the other twenty municipalities in the study area, as well as for other rural contexts with similar characteristics, either by analogy or contrast. Below are summary sheets outlining the structure and methodology applied within the proposed guidelines.

Fig. III.1.3.1.2 | Autumn in a noble palace in Polizzi Generosa ©Michele Tumminello, 2022.

III.1.3.1.1 Methodology for the explanation of the Guidelines

The guidelines index for the rehabilitationand enhancement of Polizzi Generosa is divided into various sections that cover different aspects of the territory and local architecture. After an introduction providing the context and objectives of the document, the basic architecture of the municipality is explored, with a focus on residential units, materials, and construction techniques typical of the area, such as masonry elements, balconies, openings, and roofing.

The next chapter addresses identity values and urban decor, with strategies for the preservation of heritage and the improvement of urban appearance. Another chapter is dedicated to protected heritage and the different levels of intervention, highlighting the classification of the building heritage and the corresponding intervention regulations.

The "Intervention Guidelines" section delves into the more practical aspects of redevelopment, providing specific recommendations for the historic center, above-ground elevations, and urban furniture, as well as for interventions in the municipal territory, including scattered buildings and infrastructure. Particular attention is given to *best practices*, the elimination of architectural barriers, and accessibility, with synoptic tables summarizing the suggested interventions. Finally, the document concludes with final reflections and a glossary to clarify the technical terms used.

0_Abstract
1_Introduction and Objectives
- Introduction
- The Madonie Park
- Polizzi Generosa
- Objectives of the Guidelines

2_Basic Architecture of Polizzi Generosa
- 2.1_Basic Architecture of Polizzi Generosa
  - Residential units
- 2.2_Materials and construction techniques
  - Street Openings
  - Openings and Window Spaces
  - Portals
  - Roofs
  - Cornices, Downspouts, and Rainwater Drainage Systems
  - Composition of Street Facades (Plaster and Cladding, ...)
  - Intermediate Floors
  - Metal Ties and Tie Rod Anchors
  - Stairs
  - Ceilings and Internal Partitions
  - Street Paving
  - Bibliography

3_Identity Values and Urban Decor
- Strategies for the Preservation and Achievement of Urban and Architectural Decorum

4_Protected Heritage and Levels of Intervention
- Protected Heritage
- Cataloged Heritage and Residential Buildings
- Summary Table of Levels of Intervention and Graphics
- List of Cataloged Buildings

5_Regulatory References and Intervention Guidelines
- 5.1_Code of Cultural Heritage and Landscape No. 42/2004 - DPR 31/2017
- 5.2_Building Regulations of the Municipality of Polizzi Generosa
- 5.3_RAU - Municipal Urban Furniture Regulations: Enhancement and Management of Urban Landscape Norms
- 5.4_Intervention Guidelines and Recommendations
  - **Historic Center - Facades**
    - Ground-Level and Base Sections
    - Balconies
    - Plaster
    - Frames
    - Rainwater Drainage Systems, Gutters, and Downspouts
    - Mailboxes

Utility Access Panels for Water and Gas
Verandas and Canopies
Historic Center - Last Above-Ground Elevations
Roofs
Topmost Elevations: Installation of Verandas, Roof Structures, and Other Systems for Closing Terraces and Balconies
Chimneys
Radio-Television Antennas and Satellite Dishes
Historic Center - Urban Furniture
Fountains, Benches, and Bins
Planters
Signs and Monumental Signage
Awnings
Street Lighting
Paving
Municipal Territory
Scattered Architectural Typologies in the Territory
Infrastructure and Signage
RAL Classic Color Folder
5.5_Identification of *Best Practices* from Other Contexts
5.6_Elimination of Architectural Barriers and Expanded Accessibility
5.7_Synoptic Tables of Suggested Interventions
6_Conclusions
7_Glossary of terms used

For further details, please refer to **Appendix Attachment No. 3**

**Rehabilitating madonita vernacular architecture.
Guidelines for Polizzi Generosa**

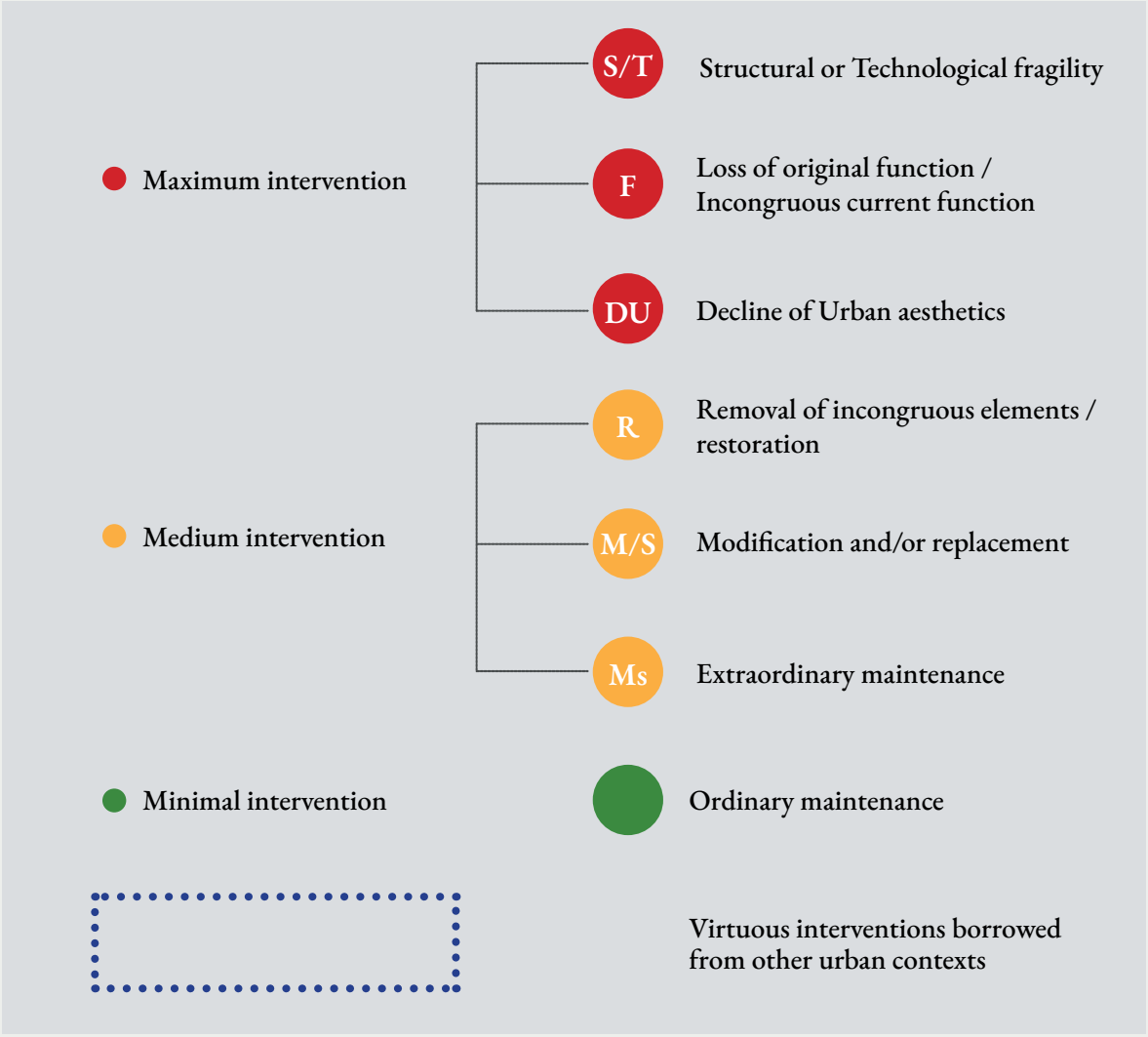
III.1.3.1.1 Methodology for the explanation of the Guidelines

The guidelines developed for the rehabilitationand enhancement of the municipality of Polizzi Generosa are structured to be easily understandable and applicable to interventions in the territory. The methodology adopted for their interpretation is divided into two main phases. First, a thorough examination of the material and construction characteristics present is conducted to understand the distinctive features of the area and identify the specific elements that characterize its identity. This analysis is crucial to contextualize the interventions and ensure that the proposed solutions respect and enhance the existing heritage.

Subsequently, a color-coded system, inspired by the "traffic light" concept, is used to classify the types of intervention required. The red color identifies interventions of the highest urgency, relating to structural fragility, loss of original function, or incongruity of the current function of the architectural detail, as well as cases of significant urban decay. Yellow interventions, of medium urgency, indicate situations that require removal, modification, replacement, or extraordinary maintenance of elements, representing an intermediate level of complexity. Finally, *green* interventions are those of minimal significance, resolved through regular maintenance or with limited costs.

Additionally, interventions are highlighted in blue when referring to solutions adopted in other local areas or similar contexts, which may address similar issues and suggest virtuous strategies applicable to the specific case.

At the bottom, the discussed diagrams are shown along with a table detailing the specifics for each type of intervention, providing a clear and practical guide for field interventions. The next section includes the example developed for the roofs in the municipality of Polizzi Generosa and an example of a façade analysis for Vicolo Cilluffo.



Maximum intervention

These are interventions requiring the expertise of a professional, a technician, or a construction team to address the identified issue. An individual citizen or homeowner cannot resolve it independently.

S/T: Structural or Technological Fragility
This refers to the building's structure or an element characterized by properties that are inconsistent with the specific features of historical constructions. These issues often result from inadequate or insufficiently context-sensitive design and execution choices that fail to respect the architectural and cultural specificities of the setting.

F: Loss of Original Function / Incongruous Current Function
The building lacks a specific function and requires interventions that balance transformation and conservation, prioritizing the preservation of its original features wherever possible. When the original functions are no longer sustainable or compatible with current needs, it becomes essential to identify new uses that respect the building's characteristics and enhance its historical and architectural identity. Interventions should aim to reintegrate existing elements while harmonizing them with contemporary solutions that are compatible with the context, ensuring its continued usability.

DU: Decline of Urban Aesthetics
A clear state of degradation that, in addition to revealing technological flaws, manifests as a loss of the building's distinctive character. The replacement of original elements with incongruous, foreign, or unrelated components disrupts the overall harmony and damages the surrounding landscape, creating both visual and cultural harm.

Medium intervention

These are interventions that the property owner can carry out independently or, in some cases, with the help of a construction team. They aim to improve urban and architectural aesthetics through the removal, modification, maintenance of the structure, or repainting.

R: Removal of Incongruous Elements / Restoration
The identified element requires immediate removal as it is considered disruptive to the architectural structure.

M/S: Modification and/or Replacement
The element can be modified or maintained to meet urban or architectural aesthetic criteria.

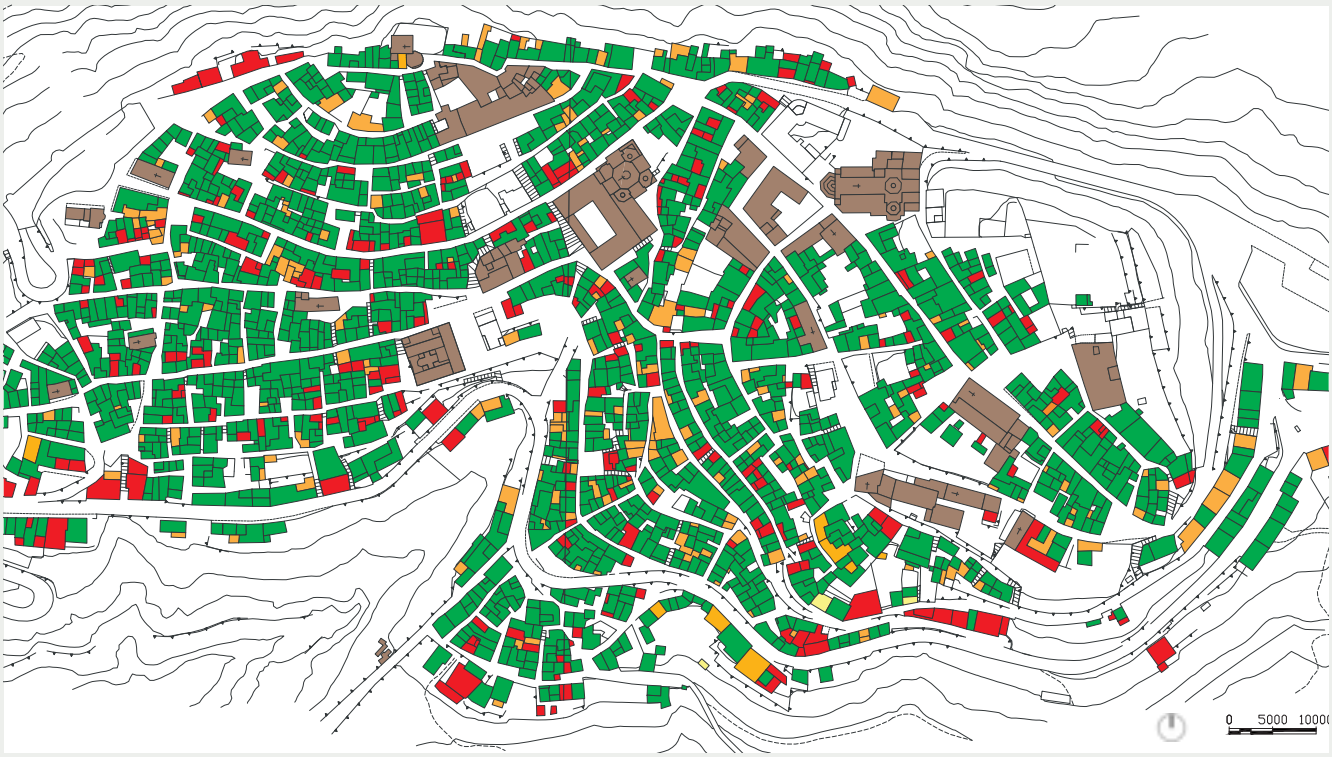
T: Extraordinary Maintenance
Repainting the element or altering its color can provide a definitive or partially corrective solution to align with urban or architectural aesthetic standards.

Minimal intervention

Ordinary Maintenance:
The element is appropriate and perfectly integrated into the urban context. The improvements needed are minimal, and it does not disrupt the urban environment or the architectural structure. It can remain unchanged without requiring any modifications.

Virtuous interventions borrowed from other urban contexts

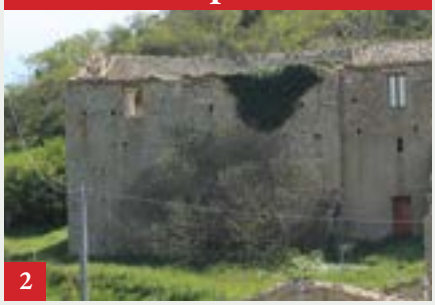
Where good practices are not observed locally, a good practice implemented in other contexts is proposed.



S/T

1. **Roof covering:** Flat roof, technologically incorrect;
2. **Horizontal closure:** Collapse of the roof and loss of its primary function;
3. **Roof covering:** Roof not covered with tiles.

F



1. **Added superstructure:** Roof veranda, to be removed;
2. **Protection of roof terraces:** Shed made of sheet metal instead of tiles, to be modified;
3. **Roof covering:** Color and material of the roof not in compliance with the technical and construction characteristics of the base architecture.

DU

The three roof coverings are exemplary cases that respect the orientation and use a roof covering made of Sicilian tiles.

R

M

T

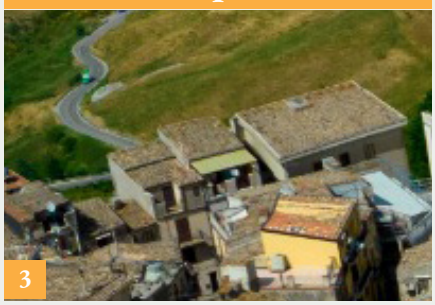


Fig. III.1.3.1.3 | Examination of the Roofs of Polizzi Generosa ©Luisa Lombardo, 2024

S/T

F

DU

R

Ms

Ms

1. **Vertical external fixtures:** Lack of fixtures;
2. **Inner partitions:** Collapse of the intermediate floor slab;
3. **Vertical external fixtures:** Closure of the window opening.

1. **Systems for smoke evacuation:** Chimney not integrated into the façade, needs painting;
2. **Vertical perimeter walls:** Presence of biological patina on the façade, needs restoration;
3. **Vertical perimeter walls:** Color alteration, needs painting.

1. **Roof covering:** Roof complies with the technical and constructive characteristics of the area;
2. **Vertical perimeter walls:** Wall facing well restored;
3. **Vertical perimeter walls:** Ground-level house with exposed brickwork, well preserved.

Fig. III.1.3.1.4 | Examination of the Facades of Vicolo Cilluffo in Polizzi Generosa ©Luisa Lombardo, 2024

Fig. III.1.3.1.5 | Hazelnut Festival in Polizzi Generosa ©Michele Tumminello, 2024.

III.1.4 Technology and Digitalisation

Technology and digitalisation are key elements for the enhancement, management, and sustainable development of communities, particularly in rural areas and small towns. The adoption of digital tools not only facilitates access to information and services but also opens up new opportunities for integrating cultural heritage, energy sustainability, and improving quality of life. Apps and websites are among the main tools for promoting cultural heritage, providing a direct communication channel with visitors and enabling them to explore history, traditions, natural beauty, and local specifics in an interactive and engaging way. Thanks to digitalisation, it is possible to create platforms that allow tourists and residents to discover both tangible and intangible heritage in an innovative manner, with virtual tours, multimedia content, and up-to-date information, fostering dynamic and participatory management (Chioni et al., 2024).

Dedicated apps and websites can also integrate useful functionalities for the community, such as mapping cultural routes, organising events, and promoting sustainable tourism activities, thereby contributing to a richer and more interactive experience (Buhmann et al., 2023). The experience initiated by the Municipality of Polizzi Generosa, through the portal visitpolizzigenerosa.it, demonstrates that it is possible to systematise resources, ensuring knowledge of the places, experiences, and excellences available in the territories. This work has been partially carried out in some municipalities of the area, but it deserves further development and expansion to involve other municipalities in the participation and systematisation of resources. The work already initiated and expanded can help the entire sector share and systematise what it has to offer. Additionally, the use of advanced technologies, such as augmented reality, would enrich visitor experiences (Ferretti et al., 2022) with real-time information and interactive content, providing tourists and residents with an immersive experience that connects them with the history and culture of the territory (Chioni et al., 2023).

Another fundamental aspect related to technology and digitalisation is the management of energy resources, particularly through the creation of digital energy communities. These communities allow for optimising local energy use by real-time monitoring of consumption, enabling the management of energy flows and the adoption of sustainable solutions such as solar power, energy efficiency, and collective self-consumption. Digital technologies play a crucial role in ensuring that resources are managed efficiently, and users can autonomously and consciously monitor and control their energy consumption. The adoption of digital platforms for energy efficiency monitoring allows for collecting valuable data, analysing consumption patterns, and implementing solutions to reduce waste, contributing to more sustainable management of local resources.

At the same time, digital technologies (Arkhipova et al., 2021) can significantly improve urban aesthetics, particularly through the implementation of modern infrastructure such as public Wi-Fi and fibre optic networks (Liew et al., 2004). Public Wi-Fi and fibre optics are also essential for facilitating access to tourist, cultural, and administrative information, creating a connection between citizens, visitors, and local institutions (Cisco Systems, 2004). Creating a digital connection network accessible to all not only improves the quality of life for residents and visitors but also stimulates the development of economic activities linked to innovation and creativity. It also ensures the internationalisation of local specialties, especially products that could have a market globally. Rural areas and small towns, which often suffer from technological isolation, can benefit from these solutions to reduce the digital divide, ensure access to online services, promote social inclusion, and attract new entrepreneurial initiatives.

Finally, the centralisation and management of resources and services through "control rooms" (Wood, 2000) represent an advanced solution for real-time monitoring and management of local operations. Digital control rooms can centralise data from various systems (energy, traffic, security,

public services) and provide crucial information for swift and informed decision-making. The centralisation of data allows for more efficient resource management and better coordination of daily activities such as infrastructure maintenance, emergency management, urban planning, and public safety. Control rooms can also integrate artificial intelligence systems and predictive analytics, improving the ability to anticipate and solve problems before they become critical, ensuring a timely and effective response (Barrientos et al., 2021). Given the region's high seismic risk, this enables real-time monitoring of potential hydrogeological instability and promotes preventive interventions, aiming at predictive maintenance of resources and assessing interventions to support.

The integration of technology and digitalisation in heritage management practices, energy resources, and urban aesthetics offers significant opportunities for the sustainable development of local communities (Passinari et al., 2011). The use of apps and websites, the creation of digital energy communities, the implementation of advanced technological infrastructure like Wi-Fi and fibre optics, and the centralised management through control rooms are all solutions that improve quality of life, foster innovation, optimise resources, and ensure a more sustainable and inclusive future for the territories (Agnoletti, 2014).

Technological innovation is a cornerstone for the progress and development of contemporary societies, including the most remote and disadvantaged areas, such as innerregions (Hincapie et al., 2016). This concept refers not only to the introduction of new technologies but also to the improvement of existing technologies, with the goal of optimizing processes, products, and services (Nasticò et al., 2018). It is not limited to the creation of new devices or software; it also includes the implementation of innovative methods for using already existing technologies to solve complex problems and improve the quality of life, local productivity, and the daily activities of a community focused on progress (Di Bitonto et al., 2010).

In inner areas like the Madonie, where resources are often limited and infrastructural challenges are significant, technological innovation can play a crucial role in overcoming historical barriers and promoting sustainable development. It allows for addressing issues such as geographic isolation, lack of essential services, and economic marginalisation. Through the adoption of advanced technologies, connectivity can be improved, access to public services facilitated, and new economic opportunities created. Advanced technologies, in fact, facilitate access to essential services such as healthcare, education, and security, significantly improving the quality of life in inner areas. For example, digital technologies allow residents to access high-quality healthcare services via telemedicine or participate in online educational programs, including training (Hopkins et al., 2017).

Technological innovation stimulates economic growth through the creation of new job opportunities and support for the development of local businesses. Furthermore, it promotes environmental sustainability through the adoption of *green* technologies, such as renewable energy, and the optimisation of natural resource use, as well as the practice of using new materials from local waste for the rehabilitationof the built heritage (Lombardo et al., 2024).

The adoption of innovative technologies can help bridge the gap between urban and rural areas, improving access to services and opportunities more equitably (Trapp et al., 2010). The spread of high-speed internet, for instance, can connect isolated communities to the rest of the world, facilitating trade, education, and civic participation.

It has the potential to profoundly transform the social and cultural dynamics of communities, fostering greater participation and social cohesion. The digitalisation of public services, for example, can make local administrations more transparent and efficient, strengthening citizens' trust in institutions.

Despite the numerous benefits, technological innovation also presents

significant challenges. It is essential to ensure that new technologies are accessible to everyone, avoiding the creation of new forms of exclusion, particularly towards older generations. Therefore, the digitalisation process must also take into account training processes and the provision of appropriate technologies to guarantee access and usability for all.

Technological innovation represents a powerful tool for transforming inner areas, improving quality of life, promoting economic growth, and reducing inequalities. However, its success depends on careful planning and the inclusion of local communities at every stage of the innovation process.

First and foremost, the training process is crucial. The use of technology in remote contexts like these is not easily applicable, both for young people and the elderly (Cho et al., 2023; Tang et al., 2024). Projects like NONNO Lab[1], Nonni su Internet[2], and Terza Età Online are just a few examples that have been undertaken with great success in Italy. Also noteworthy is the proliferation of digital help desks established in small municipalities, aimed at providing free consultations to facilitate access to the Internet and ensure the use of SPID, an initiative that is now expanding rapidly to other municipalities and parts of the world (Lucan et al., 2024).

This process, based on the adoption of advanced digital tools and platforms, has revolutionized the way information is generated, processed, distributed, and used, deeply influencing the economy, culture, and functioning of both public and private institutions (Mao et al., 2024).

Digital innovation is not limited to the mere introduction of new technologies but also involves a profound cultural, organizational, and methodological change. To fully exploit the potential of emerging technologies, organizations must rethink their operational models, revise inner processes, and develop new skills. This transformation journey, also proposed by the EU[3] in terms of an evaluation matrix and key phases in digital transformation (*Fig. 1*), requires a consistent and strategic integration of digital technologies, addressing challenges related to security, data management, and sustainability (*Fig. 2*).

In small communities, where services often depend on larger urban centers, the digitalisation of administrative practices becomes an unavoidable priority. The implementation of digital help desks simplifies and speeds up bureaucratic processes, reducing the distance between citizens and decentralized administrations and decreasing dependence on larger cities (Mukhsin et al., 2018). A robust network infrastructure, starting with broadband, is just the first step. Next, it is essential to invest in the use of databases and integrated platforms that support the management and secure sharing of data; digital clouds and protection measures for these data are also crucial.

This digitalisation not only concerns the management of administrative practices but also has a direct impact on the quality of services offered to the community. Data, in fact, become a valuable tool to inform citizens in real-time, for instance, about traffic conditions or road closures (Lombardo, 2022), to promote safe and informed mobility in mountain areas, and to encourage the use of public transport (Stein et al., 2022). In this way, digital innovation contributes to building a more efficient and connected community, strengthening participation and quality of life even in the most remote areas.

[1]The NONNO LAB project, promoted by the Il Tulipano Bianco A.P.S. association, offers a digital training course for elderly people, aimed at promoting digital inclusion and making everyday technologies accessible to older individuals. The program focuses on basic skills, such as the use of smartphones, tablets, and PCs, and is divided into ten practical lessons, each dedicated to a specific aspect of technology. The lessons cover topics such as phone usage, messaging, WhatsApp, social media, and protection from viruses and phishing. The course is held every Monday by Dario Casani at the Centro Sociale Anziani Ostiense ex Mercati Generali and concludes with a final test and the distribution of participation certificates.

[2] "Nonni su Internet" is a national digital literacy project aimed at people over 60, established with the goal of spreading basic digital skills among the elderly. Active for fourteen editions, the programme has trained over 30,000 "senior internet users," 65% of whom are women, thanks to the support of 21,000 tutors, school students, and 2,100 coordinating teachers. The project has involved 20 Italian regions and has reached 11 foreign countries, offering an intergenerational learning model that promotes the exchange of knowledge between young people and the elderly.

The courses take place in computer rooms at schools of all levels, with classes made up of 20-25 elderly participants, often grandparents of the same students, or attendees of social centres or other local associations. The free course lasts 30 hours, divided into 15 weekly sessions of two hours. Each elderly participant is paired with a tutor and a teacher specialising in technology, ensuring an optimal ratio of one tutor for every two participants. At the end of the course, all participants receive a certificate of participation, and the schools include the project in the Educational Offer Plan (Pof), also awarding academic credits to the students involved.

The programme covers the basics of computer use, from internet browsing and email to social networks. Additionally, it introduces participants to the use of peripherals such as cameras and scanners, as well as modern devices like smartphones and smart TVs, to help familiarise them with new communication technologies. Each edition includes the creation of a multimedia project, produced together by tutors and participants, such as a dictionary of traditional games or a digital photo album.

To further spread digital skills, the project provides free manuals and guides on its website, while the Coordinator for Innovation in Schools, Cecilia Stajano, can be contacted for more information.

[3] The European Network for Rural Development, in the text "*Smart Villages* and Rural Digital Transformation," outlines the key steps for digitalisation in rural areas in the CAP Strategic Plans: mapping existing political support, identifying opportunities and needs through SWOT analysis, and defining priorities for targeted interventions. These include investments in local infrastructure, training to reduce the digital divide, and cooperation through the LEADER programme for pilot projects and digital hubs. Finally, it is essential to set objectives, allocate budgets, and implement the necessary interventions.

A. The extent and quality of digital resources and skills	Digital infrastructure (incl. WIFI) and public access points	Score (1-5)	Score (1-5)
	The existence of creative, work, innovation and maker spaces/hubs	Score (1-5)	Score (1-5)
	Coordination by a multi-skilled individual/ team (within a wider network)	Score (1-5)	Score (1-5)
	Local & networked experts, skills, technical support & equipment pool	Score (1-5)	Score (1-5)
B. The types of digital functions that the village can carry out	Facilitation of social and economic digital inclusion of local stakeholders	Score (1-5)	Score (1-5)
	Support to digital and social innovation and co-creation in coordination with external policy-makers/service deliverers	Score (1-5)	Score (1-5)
	Mediation/brokerage services to enable the village to access external Research, Technological Development and Innovation (RTDI)	Score (1-5)	Score (1-5)
	Relay for national and regional Digital Innovation Hubs (DIH) and Incubator/Accelerator networks	Score (1-5)	Score (1-5)

Fig. III.1.4.1 | Matrix for assessing the digital maturity of a village or rural area ©European Network for Rural Development, 2024.

Fig. III.1.4.2 | Key stages in the digital transformation of rural areas ©European Network for Rural Development, 2024.

III.1.4.1 Accessibility and Design for All

The rural and mountainous areas of Sicily, such as the Madonie district, are often characterised by complex topography and constraints related to the preservation of historical-architectural heritage, making the implementation of accessibility interventions even more challenging. While the previous section discussed digital accessibility, it is equally important to consider physical accessibility. Ensuring universal access to technologies, goods, services, and infrastructure is essential to promote inclusion and territorial equity, while also supporting the enhancement of these areas (Moseley, 1979). The concept of "*Design for All*" presents itself as a design philosophy that embraces an inclusive vision, aimed at creating environments, products, and services usable by anyone, regardless of their physical or cognitive abilities. It was introduced by architect Ronald L. Mace in 1985 to describe a design process that responds to the needs of a wide range of people, including those living with disabilities (Farrington et al., 2005). Over the years, the concept has evolved through various approaches, such as *Inclusive Design* and Human-Centered Design, eventually leading to *Design for All*, as established by the 2004 Stockholm Declaration. The goal of these approaches is clear: to design for human diversity.

In 1997, the Center for Universal Design at the University of North Carolina formalised seven principles that guide *inclusive design* (ESPON, 2019), which, to this day, must remain the core of any design process, both before and after:

- ***equitable use:*** the use must be equitable, allowing everyone to access the same opportunities without discrimination;
- ***flexibility in use:*** the design must ensure flexibility, adapting to the different abilities and preferences of users;
- ***simple and intuitive:*** products and environments must be simple and intuitive to use, without requiring complex instructions;
- ***perceptible information:*** information must be conveyed clearly, regardless of environmental conditions or the user's sensory abilities;
- ***tolerance for error:*** the design must minimise the risks of error or inappropriate use;
- ***low physical effort:*** the use must require minimal physical effort;
- ***size and space for approach and use:*** spaces must be suitable for access and use by everyone.

In contexts like the Madonie region, characterised by a high historical and scenic value, the adoption of these principles must be integrated with respect for the existing urban fabric and the need to preserve the authenticity of the places. An inclusive project in the inner areas of Sicily, therefore, must not only address the needs of the resident population (which often includes mainly elderly people and those with disabilities), but also do so by taking into account geographical specifics and the cultural, and especially architectural, pre-existing elements.

Physical accessibility relates to the design and adaptation of public and private spaces to ensure they can be used by everyone, including people with disabilities (Farrington et al., 2005). To improve physical accessibility, it is essential to implement solutions such as suitable ramps and elevators that allow access to buildings, structures, and parts of urban areas without barriers. Ramps must be designed with an appropriate slope, sometimes even partially replaced by small stairways when too steep, and elevators should be spacious and easy to use, integrating into the urban context, even if this sometimes goes against traditional principles of urban decor.

For this reason, knowledge of traditional architecture and techniques is useful to understand the type of interventions to be implemented, given the numerous architectural barriers found in the many staircases and kerbs of the innervillages (Lombardo et al., 2023). This accessibility must also be evaluated within buildings, contributing to the proper usability of spaces

for those with disabilities.

Along with physical accessibility, visual accessibility is equally important. The design must be simple and intuitive, ensuring that it is easily understandable and usable without the need for complicated instructions. Additionally, the integration of assistive technologies is essential to allow people with disabilities to fully participate in society. These tools include vocal screens, screen readers, and other aids that enhance interaction with the digital and physical world; the use of fonts suitable for easier reading of texts and signage is also crucial. Finally, user involvement in the design process is essential.

Moreover, signage, whether monumental or street, must be clear and highly visible, with appropriate contrasts and large characters, and include tactile and Braille indications for visually impaired people.

The flooring and furnishings should be designed to ensure safety and comfort while adhering to principles of urban decor as outlined by possible colour plans, rehabilitationmanuals, or guidelines, such as those for the Municipality of Polizzi Generosa[1], output of the following thesis. It is important to use non-slip materials and avoid obstacles that may impede movement.

The experiences and *feedback* from people with disabilities provide valuable information to refine and improve accessibility.

The application of these principles extends to various sectors, such as architecture and urban planning, by designing buildings and public spaces with ramps, elevators, and accessible pathways. Industrial and user interface design also benefits from these principles, with products and services designed to be usable by a wide range of people, not least considering that the user experience must be guaranteed in every case.

The design of *green* spaces should also take accessibility into account, including paths and equipment usable by everyone, such as benches and adjustable tables, as well as shaded areas for hot and humid summers or shelters for particularly cold winters.

Digital accessibility, already widely discussed in the previous section, must be integrated with physical accessibility, as done for the totems for the Municipality of Polizzi Generosa. Developed with the great synergy of CoopCulture (see *Fig. 1*), it allows the municipality to be known online via a QR code and expands the local cultural offerings.

The initiative is aimed at both physical and digital accessibility, or rather, an innovative approach to digital heritage. Corten steel totems that enhance heritage while seamlessly integrating into the local context also respect all types of disabilities, whether visual or physical, allowing access even for wheelchair users or those with limited vision.

Raising awareness and training at this stage are crucial to promote a culture of inclusion and ensure that design practices adhere to accessibility principles (Mikou, 2019). Training programmes aimed at designers, architects, public administrators, and citizens help spread the knowledge and skills necessary to implement universal design. Public awareness campaigns can educate the public on the importance of accessibility and the benefits it brings to the entire community.

It is also helpful to collaborate with associations representing people with disabilities to obtain *feedback* and suggestions that can improve design and inclusion practices.

Accessibility regulations provide guidelines and legal requirements to ensure that buildings, public spaces, and technologies are accessible to all. In Italy, Law 104/1992 establishes the fundamental principles for the assistance and inclusion of people with disabilities, while Law 246/2005 defines specific requirements for the accessibility of spaces and structures. At the European level, Directive 2016/2102 sets standards for the accessibility of websites and mobile applications of public authorities.

To ensure compliance with these regulations, it is important to keep them updated to reflect new technologies and emerging needs. Implemen-

[1] Visit Polizzi Generosa. Visit Polizzi Generosa. https://visitpolizzigenerosa.it/it/ [last accessed on 14 settembre 2024]

ting these practices not only improves the quality of life for people with disabilities but also enriches society as a whole by promoting inclusion and equality.

Fig. III.1.4.1.1 | Alleyways of Petralia Sottana ©Luisa Lombardo, 2024.

LEGENDA:

1 Chiesa del SS. Crocifisso
2 ruderi chiesa Madonna del Castello
3 ex Chiesa S. Francesco/ Auditorium comunale
4 Chiesa dell'Annunziata
5 Chiesa di S. Margherita o Badia Vecchia
6 Chiesa di S. Nicolò de Pranchis
7 Chiesa della Madonna delle Grazie o Badia Nuova
8 Chiesa di S. Gandolfo la Povera e Collegio di Maria
9 Chiesa Maria SS. Assunta
10 Palazzo Gagliardo
11 Chiesa di S. Girolamo
12 ex Collegio dei Gesuiti o Palazzo della cultura
13 Chiesa di S. Caterina o Battuto
14 Palazzo Carpinelli
15 Palazzo Caruso
16 Chiesa di S. Oreste
17 Chiesa della Madonna degli Schiavi
18 Chiesa di S. Antonio Abate
19 Chiesa di S. Mario Lo Piano
20 Chiesa dell'Urbenica
21 Chiesa di S. Panoxuzo e Torre di Leo
22 Commenda

posizionamento segnaletica esistente

Area sprovvista di segn
23 convento dei padri
chiesa Santa Spera

ALCUNI PARTICOLARI ESEMPLIFICATIVI: STATO DI FATTO E STATO DI PROGETTO

1 Chiesa di San Francesco, segnaletica obsoleta,alta e su scalini

2 ruderi Chiesa Madonna del castello, segnaletica alta

13 Chiesa di Santa Caterina: segnaletica obsoleta e collocata in posto limitato dal traffico e a ridosso di decorazione architettonica

ESEMPIO DI GRAFICA, STATO DI FATTO

7 Chiesa Madonna delle Grazie o Badia Nuova

7 Chiesa Madonna delle Grazie o Badia Nuova

7 stato di fatto, con segnaletica obsoleta e troppo vicina al bugnato

7 progetto e ricollocamento

16 Chiesa di Sant'Oreste: segnaletica obsoleta e troppo vicina al portale

16 stato di fatto, con segnaletica obsoleta e troppo vicina al bugnato

16 progetto e ricollocamento

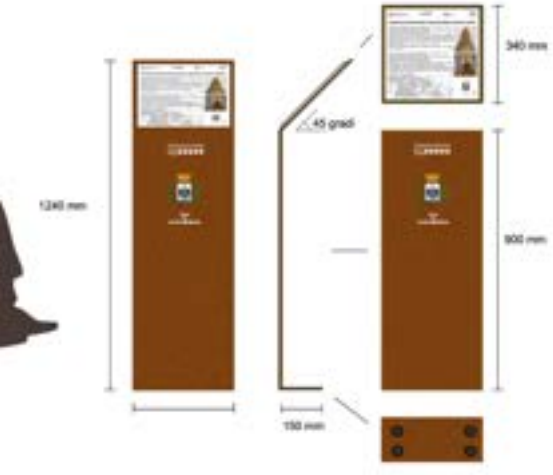
aletica monumentale e con intenzione di integrare
Domenicani, Oratorio del SS.Rosario e
o (tutti tre ruderi parzialmente demoliti)

ESEMPIO DI GRAFICA, PROGETTO

) Chiesa Madonna delle Grazie o Badia Nuova

i resti Chiesa dei padri Domenicani, Oratorio del SS. Rosario e Chiesa del Santo Spirito: progetto di integrazione segnaletica

PARTICOLARE DEL TOTEM ILLUSTRATIVO



PARTICOLARE DI INTERVENTO DI AREA SPROVVISTA DI SEGNALETICA

i resti Chiesa dei padri Domenicani, Oratorio del SS. Rosario e Chiesa del Santo Spirito, scelta di tutto

III.2 Tools for managing Smart Villages

In the development of *Smart Villages* in the rural areas of the Madonie, as well as in other contexts, either by analogy or contrast, it is essential to follow a structured pathway, moving from strategic elements to operational ones. Among the key aspects to consider is the identification of the main *stakeholders*: *governance*, community, heritage preservation, and the implementation of digital technologies, as discussed in the previous sections. These *stakeholders*, however, require a precise process to follow, organised into various stages that include guidelines (Mańkowska et al. 2024), forming the strategic foundation, followed by *best practices*, *business plans*, and finally management protocols. In detail:

- **guidelines:** these provide a framework of general principles and strategic orientations capable of steering the project towards a digital and sustainable approach tailored to the territorial specificities and the needs of the Madonie communities;
- *best practices*: these follow the guidelines as proven and replicable operational models, offering concrete solutions inspired by successfully implemented experiences. They help translate general principles into practical examples that can be locally adapted;
- **business plan:** this represents the project's economic and financial framework. Based on the guidelines and *best practices*, it details economic sustainability and the necessary investment plans, ensuring that resources are efficiently allocated to support the project's long-term objectives;
- **management protocol:** This outlines operational procedures, roles, and responsibilities for each project phase. It guides the practical execution of actions, addressing *governance*, community integration, heritage preservation, and the implementation of digital technologies.

Each element builds a support system necessary for the next, ensuring that the project develops with a solid strategic foundation, tested operational models, a well-defined financial plan, and an effective management framework.

Fig. III.2.1 | Four Steps to Achieving Smart Villages ©Luisa Lombardo, 2024.

In addition to a purely technological approach, it is essential to evaluate the feasibility of interventions ex ante, proceeding systematically to organise the activities to be undertaken in an orderly manner.

III.2.1 Guidelines and *Best Practices*

In light of the analysis conducted so far, it was deemed appropriate to examine the "network" thematic maps developed for the Atlas to understand the current situation in the Madonie. These maps aim to identify which municipalities, across the various themes explored, can be considered exemplary in terms of project development. They also assess how initiatives can be re-evaluated to promote active participation from communities that have remained uninvolved (Letaifa, 2015).

These maps (available in the Atlas of technological solutions for the Madonie District) take into account the total number of municipalities within the Upper, Lower, and Madonie Imeresi areas, alongside those recently affiliated with the GAL, as outlined in Chapter II. They seek to trace the path these municipalities have taken in recent years towards achieving projects aimed at forming *Smart Villages* (Stoustrup, 2021).

From the analyses conducted, it emerged that the Madonie region is not yet equipped with municipalities capable of exploring and advancing the concept of *Smart Villages*. However, there is still a long way to go, and several parameters are deemed necessary to contribute to a network of *Smart Villages* in the Madonie. Therefore, following specific processes is essential for the shared management of resources and the development of strategies (Zavratnik et al., 2018) and synergistic projects. This can be achieved through guidelines and *best practices* (European Parliament, 2005).

Below is a list of actions to be undertaken within the Madonie Park and its 21 associated municipalities to create *Smart Villages*. It should be noted that, starting from the guidelines (European Union, 2023), the subsequent *best practices* are derived, specifying how these should be applied concerning the central theme:

Community integration and active participation
Engage citizens in decision-making and the management of cultural assets to foster an aware and responsible community.
Best practices:
- establish working groups and listening platforms to gather proposals and *feedback* from citizens;
- organise *co-design* sessions, workshops, and focus groups to encourage active participation and build shared solutions;
- promote initiatives for associationism and community cooperation, encouraging the creation of local cooperatives for managing services and heritage.

Inclusive and transparent governance
Implement *governance* that is transparent and capable of addressing community needs, with clear policies for the protection and enhancement of heritage.
Best practices:
- develop a strategic plan that integrates conservation, innovation, and sustainability, ensuring it is accessible to all citizens;
- facilitate public-private partnerships to attract resources and expertise, supporting cultural and heritage preservation initiatives;
- establish monitoring indicators to periodically assess the impact of preservation initiatives and implement improvements based on the results;
- integrate tools for heritage management.

Technology implementation and digitalisation
Leverage technological tools to enhance access to information, communication, and heritage conservation, as well as to optimise local services.
Best practices:
- digitise cultural assets and create an online platform allowing both citizens and tourists to explore the cultural and natural heritage of the

village;
- use sensors and monitoring technologies for predictive maintenance of historical assets, preventing damage and preserving original materials and structures;
- develop apps or digital portals to engage the community in decision-making and collect *feedback* or suggestions on ongoing initiatives.

Enhancement of tangible and intangible Heritage
Safeguard the village's tangible and intangible resources and promote them as cultural and tourist assets.
Best practices:
- undertake restoration and maintenance projects that respect traditional construction techniques and local materials, preserving the authenticity and historical value of assets;
- organise festivals, exhibitions, and cultural trails that showcase local traditions and skills, involving artisans, artists, and the community;
- support the transmission of traditional knowledge and local expertise by offering courses and workshops to educate new generations and visitors.

Sustainability and circular economy
Adopt a circular economy model to promote environmental sustainability and waste reduction, encouraging recycling and reuse in local activities.
Best practices:
- encourage local businesses to use renewable resources and create products with sustainable materials;
- organise awareness campaigns on the importance of sustainability and the circular and responsible management of resources.

Accessibility and inclusion
Ensure that initiatives and points of interest are accessible to everyone, regardless of physical abilities or cultural background.
Best practices:
- ensure that cultural trails, buildings, and digital information are accessible, and provide structural adjustments to venues for inclusion.

The development of *Smart Villages*, therefore, requires a holistic and collaborative approach. The guidelines and *best practices* outlined above are essential to ensure that such projects are sustainable, inclusive, and capable of improving the quality of life in rural communities, while also implementing proposals and projects for and with the community. Technological innovation, when driven by community engagement and a long-term vision, can transform villages into centres of prosperity and well-being.

These are, therefore, fundamental and necessary references to guide the design and management of *Smart Villages*; regulatory documents that provide guidance on how to address specific aspects of the management and development of these villages, offering a methodological and operational framework. *Best practices*, on the other hand, represent the most effective strategies and solutions, developed based on positive experiences and tangible successes. These tools are crucial to ensuring that projects align with the highest standards and efficiently and sustainably meet local needs.

III.2.1.1 Application areas

The guidelines and *best practices* identified are useful for developing management and organizational processes for *Smart Villages*, drawing inspiration from both the Atlas developed and the concrete needs identified in the territory. Each area of application requires a targeted approach to ensure optimal results, also considering the principles of the 2030 Agenda for Sustainable Development. For this reason, the Guidelines refer to the 12 categories of the developed Atlas, while also covering additional areas, sometimes

even intersecting, to contribute to the sustainable and *green* development of the Madonie area.

Among the main areas of intervention are the management of technological infrastructure, environmental sustainability, economic and social development, and public safety and health.

As an example, these may concern technological infrastructure, including the design of connectivity networks and the integration of *IoT* devices to facilitate land management, as well as monitoring and predicting maintenance interventions. These guidelines may also promote the adoption of renewable energy and advanced waste management practices. In the economic and social context, the focus is also on active community involvement and the promotion of initiatives related to sustainable tourism. In the context of public safety and health, they may involve the introduction of telemedicine systems and tools for monitoring air quality, thus contributing to the well-being of the population.

III.2.1.2 Objectives and benefits

The main objectives are to ensure effective and efficient land management, promoting an integrated approach that combines technological innovation, environmental sustainability, and community participation. The benefits include the definition of quality standards and operational procedures that encourage the adoption of advanced technologies and strategies consistent with the principles of sustainable development. These include improving territorial organization, optimizing available resources, and promoting inclusive and participatory *governance*.

Among the main benefits are the improvement of the quality of life and the consistency of services provided, enabling more transparent and accessible management for all inhabitants. The adoption of optimized solutions significantly reduces operational costs, freeing up resources for further strategic investments. Increased environmental sustainability, achieved through innovative and low-impact practices, contributes to the protection of the territory and the enhancement of quality of life.

Another benefit is the strengthening of social cohesion, thanks to processes that promote inclusion and active participation of the local community. This involvement not only values the role of residents but also stimulates the creation of new economic and social opportunities, consolidating a sense of belonging to the territory. The standardization of practices facilitates the replicability of virtuous models, allowing the spread of successful experiences in other contexts, with a positive impact on a larger scale.

III.2.1.3 Development and implementation

Their development and implementation are based on a structured and systematic process, taking into account the specific characteristics of the territory and the challenges that need to be addressed. The first phase consists of a detailed analysis of local needs, aimed at identifying priorities, critical issues, and opportunities. This preliminary study provides a clear and contextualized framework, essential for developing guidelines and operational practices that effectively respond to the identified needs.

The drafting of the guidelines represents the next step and is characterized by the formulation of recommendations based on the conducted analysis. These recommendations include innovative technical and operational solutions that reflect the principles of sustainability, efficiency, and inclusiveness. The goal is to define practical tools and strategies that can optimize resource management and promote local development.

Implementation requires active involvement of *stakeholders* through targeted training programs, designed to ensure a deep understanding of the suggested practices. At the same time, the adoption of the guidelines must be supported by a continuous monitoring system, enabling the tracking of progress, identification of potential issues, and the introduction of modifications or adjustments when necessary.

A crucial element is the *feedback* and periodic review mechanism, which ensures the constant relevance and potential modification or optimization of the guidelines over time. This iterative approach allows for prompt responses to new needs or changes in the context, ensuring flexible management and a focus on continuous improvement.

III.2.1.4 Role in innovation and change

Guidelines and *best practices* play a crucial role in promoting innovation and territorial change for achieving the goals within *Smart Villages*, acting as catalysts for the development of advanced and sustainable solutions. A structured and reliable foundation facilitates the introduction of emerging technologies and the integration of innovative methodologies, enhancing the ability of local communities to adapt to future changes and challenges.

By promoting advanced technologies and adopting innovation-oriented strategies, the guidelines foster the modernization of infrastructure and services, stimulating a profound transformation of rural communities. This process helps make them models of sustainable development, capable of combining tradition and progress in a virtuous balance.

Best practices facilitate change through the standardization and sharing of effective solutions, creating a favorable environment for experimentation and the spread of new ideas. This approach encourages a continuous cycle of improvement, promoting not only the application of innovative technologies but also the development of collaborative and participatory strategies, which strengthen the resilience and competitiveness of rural communities.

Fig. III.2.1.4.1 | Students seeking ideas for the rehabilitation and enhancement of the Flemish triptych of Polizzi Generosa ©Luisa Lombardo, 2024.

COMMUNITY INTEGRATION AND ACTIVE PARTICIPATION

Engage citizens in decisions and the management of cultural heritage to foster an informed and responsible community:
- Create working groups and listening platforms to collect proposals and feedback from citizens.
- Organize co-design sessions and workshops to encourage active participation and build shared solutions.
- Promote associationism and community cooperation initiatives, encouraging the creation of local cooperatives for the management of services and heritage.

INCLUSIVE AND TRANSPARENT GOVERNANCE

Implement transparent governance capable of responding to the community's needs, with clear policies for the protection and enhancement of heritage.
- Develop a strategic plan that integrates conservation, innovation, and sustainability, and is accessible to all citizens.
- Facilitate public-private partnerships to attract resources and expertise, supporting cultural initiatives and heritage protection.
- Establish monitoring indicators to periodically assess the impact of protection initiatives and make improvements based on the results obtained.

TECHNOLOGY IMPLEMENTATION AND DIGITALIZATION

Use technological tools to improve access to information, communication, and heritage preservation, as well as to optimize local services.
- Digitize cultural assets and create an online platform that allows both citizens and tourists to explore the cultural and natural heritage of the village.
- Use sensors and monitoring technologies for predictive maintenance of historical assets, preventing damage and preserving original materials and structures.
- Create apps or digital participation portals to engage the community in decision-making and gather reports or suggestions on ongoing initiatives.

VALORIZATION OF MATERIAL AND IMMATERIAL HERITAGE

Safeguard the material and immaterial resources of the village and promote them as cultural and tourist assets.
- Carry out restoration and maintenance interventions that respect traditional techniques and local materials, preserving the authenticity and historical value of the assets.
- Organize festivals, exhibitions, and cultural tours that highlight local traditions and skills, involving artisans, artists, and the community.
- Support the transmission of traditional knowledge and local know-how by offering courses and workshops to educate new generations and visitors.

SUSTAINABILITY AND CIRCULAR ECONOMY

Adopt a circular economy model to promote environmental sustainability and waste reduction, encouraging recycling and reuse in local activities.
- Encourage local businesses to use renewable resources and create products with sustainable materials.
- Organize awareness campaigns on the importance of sustainability and responsible resource management.

ACCESSIBILITY AND INCLUSION

Ensure that initiatives and places of interest are accessible to all, regardless of physical abilities or cultural background.
- Ensure that cultural routes and digital information are available in accessible formats and make structural adaptations in historical sites for inclusion.

Fig. III.2.1.4.2 | Methodology for Implementing Guidelines and Best Practices for the Development of Smart Villages ©Luisa Lombardo, 2024.

Methodological parameters to consider for the development of a Business Plan capable of promoting the development of smart villages.

III.2.2 *Business Plans*

The effective management of a *Smart Village* requires the creation of well-structured management protocols and strategic *business plans* (Goyal et al., 2017). Management protocols establish the necessary standards for implementing and maintaining smart and sustainable technological solutions, while the *business plan* provides a strategic and operational vision to ensure the economic sustainability and long-term success of the solutions to be undertaken. This section will explore the key elements of management protocols and *business plans*, discussing the implementation and monitoring phases, and highlighting the importance of an integrated approach to ensure the success of *Smart Villages*.

III.2.2.1 Key Elements of *Business Plans*

In the context of sustainable development in the minor centers of the Madonie, *business plans* play a crucial strategic role in translating visions and strategies into concrete and measurable actions. The key elements of a *business plan* for a *Smart Village* are structured across several interconnected levels, addressing the specific characteristics of the Madonie territory under study.

A primary element is the enhancement of cultural and natural heritage, which in the Madonie includes a rich array of protected resources, from historical centers to artisanal and gastronomic traditions, and unique ecosystems in the Madonie Park. These heritages represent the heart of the project and the foundation on which initiatives that attract both residents and tourists should be built.

A second element is the involvement of the local community, necessary to ensure the success of the project and promote participatory *governance*. The community becomes a central actor in managing and promoting the territory through cooperatives, associations, and *co-design* processes.

Digitalisation and technological innovation form another pillar. Digital transformation in the Madonie could mean creating digital archives of cultural heritage, using applications for tourism and public service management, and implementing *IoT* sensors to monitor natural and architectural heritage (Morris et al., 2005).

Finally, the financial analysis and economic sustainability plan complete the business plan. Considering the predominantly fragile nature of the local economic fabric, it is essential to identify diversified resources, from European rural development funds to potential private contributions, as well as income generated from tourism, local cooperatives, and other initiatives to be launched.

III.2.2.2 *Business Plan* structure

The *business plan* is a fundamental tool for planning, organizing, and evaluating the sustainability of a project (Paiola et al., 2024). However, when applied to the context of *Smart Villages*, it takes on particular characteristics that distinguish it from the classical model, while maintaining some underlying analogies. Both share a general structure articulated in key sections such as the project summary, context analysis, operational strategy, and financial planning. The main objective is to define a clear path that enables the achievement of set results by optimizing available resources and maximizing benefits for *stakeholders*. Similarly, both require a thorough context analysis to identify opportunities and challenges, as well as a detailed economic feasibility assessment. Moreover, in both cases, success depends on the ability to build strategic partnerships, which in the case of *Smart Villages* often involve local actors, public entities, and non-governmental organizations (Muller et al., 2015).

What substantially differentiates a classical *business plan* from one developed for *Smart Villages* is the context in which it is applied and the goals it pursues. In the traditional model, the focus is often on urban or business sectors, characterized by high competitive density and the pursuit of imme-

diate financial profits. In rural villages, however, the *business plan* takes on a broader dimension, where economic objectives intertwine with social and environmental goals. The main focus is not just economic growth, but also countering depopulation, social cohesion, and the enhancement of cultural and natural heritage. Consequently, the target changes: while the classical *business plan* primarily addresses private investors and customers, that for *Smart Villages* involves local communities, public entities, and tourists, aiming to meet collective needs through an inclusive and sustainable development model (Rosati et al., 2016).

Another distinguishing element is represented by the key success factors. In the classical business plan, the focus is often on product or service innovation, competitiveness, and operational efficiency. In the case of *Smart Villages*, success depends on the ability to engage the local community, protect and enhance heritage, use technology appropriately, and create participatory *governance*. Technology, which in the traditional model is used predominantly to innovate products and services, becomes a key tool to improve the quality of life in rural areas. Initiatives such as the digitalisation of heritage, environmental monitoring, or the creation of platforms for active citizen participation are concrete examples of this approach.

The economic model also differs significantly. While the classical *business plan* relies on economies of scale and maximizing return on investment, the one for *Smart Villages* integrates mixed economic models, where the circular economy, experiential tourism, and community cooperation play a central role. This reflects the nature of rural projects, which often seek to balance economic and social aspects, aiming to generate a positive impact on people's quality of life and the environment.

Finally, the evaluation of impact changes. In the classical model, success is predominantly measured in terms of profit and market growth, while in the context of *Smart Villages*, the evaluation is holistic. Economic indicators are complemented by social metrics, such as the level of community cohesion or the ability to counter depopulation, and environmental ones, such as landscape preservation and reduction of ecological impact. This approach reflects a paradigm shift, where development is seen not only as an economic process but as a balance between growth, sustainability, and the enhancement of local resources.

The *business plan* for a *Smart Village* in the Madonie is structured to reflect the specifics of the territory, while promoting a replicable model for other rural areas by analogy or contrast.

Therefore, the following structure is proposed for consideration:

Executive Summary

A summary highlighting the role of the *Smart Village* as a driver of development for the Madonie, emphasizing the benefits for residents and its cultural and tourism potential. For example, it could be presented as a "distributed laboratory" for experimenting with new models of *governance* and sustainability.

Project Description

The proposed project should enhance the minor towns of the Madonie, with interventions ranging from the rehabilitationof architectural heritage to the creation of thematic paths related to biodiversity and local history, along with the adoption of technologies that improve accessibility and public services in line with the 2030 Agenda or new goals promoted by Europe.

Market Analysis

The target audience study includes examining the flow of tourists seeking authentic experiences, young entrepreneurs interested in the potential of rural areas, and residents aspiring to an improved quality of life. Industry trends highlight a growing demand for sustainable tourism and a return to smaller towns, supported by national and European policies.

Operational Strategy

The plan should include integrated activities, such as:

- the digitization of historical heritage, with virtual tours and interactive

applications;
- the organization of cultural festivals that highlight local traditions and flavors;
- the formation of cooperatives for managing social, economic, tourism, and cultural services.

Marketing strategy
- a territorial campaign could focus on the concept of "Madonie 4.0" or Madonie of the future, positioning the towns as cutting-edge destinations, capable of combining authenticity and innovation for a long-term vision.

Funding sources
- the plan includes a mix of public and private resources. Key sources include European funds for digital transition, national programs for rural areas, and partnerships with companies interested in investing in *green* and innovative projects.

Financial analysis
- analyze any cost items considered or to be considered, as well as the annual cost of the solution.

Evaluation and monitoring

The use of indicators such as the number of users, community engagement, and direct economic impact will allow progress to be measured and strategies to be adapted as the work progresses.

III.2.2.3 Project implementation phase

- Planning and coordination

The implementation phase begins with careful operational planning that defines clear objectives, timelines, resources, and responsibilities. Once the strategic plan is outlined in the business plan, it is necessary to translate the guidelines into concrete actions. A key element of this phase is coordination among all involved actors: local administrations, communities, private businesses, public entities, and other organizations. Each partner must have a specific role, and the decision-making process should be clear, transparent, and participatory.

- Compatible development of infrastructure and technologies

A fundamental part of implementation is the creation of technological infrastructures. Digital connectivity, *smart governance* solutions (such as platforms for citizen engagement), and technologies for managing natural resources (like sensors for environmental monitoring) are just some of the areas that require attention. The goal is for technology to improve the quality of life without altering the local heritage and culture, but rather supporting its enhancement.

- Training and community inclusion

Another crucial aspect of implementation is the training of the local community. Residents must be prepared to use new technologies and actively involved in decisions related to village management. This not only facilitates the acceptance of the project but also fosters a strong sense of belonging and responsibility.

III.2.2.4 Project monitoring phase

- Definition of success indicators

Monitoring should begin with the definition of clear indicators that measure the impact and effectiveness of the actions implemented. These indicators must be specific, measurable, and aligned with the initial project objectives. Some examples of indicators include improving access to digital services, the level of community participation, and the efficiency in managing natural resources.

- Monitoring tools and data collection

To monitor the evolution of the project, advanced data collection tools are necessary. The use of digital platforms, *IoT* (Internet of Things) sensors for Cloud, and mobile applications enables the collection of real-time data on

various aspects of the village, such as energy consumption, air quality, waste management, and civic participation. These data must then be analyzed to adjust and optimize ongoing policies.

- *Feedback* and participatory evaluation

A fundamental aspect of monitoring is the continuous involvement of the community. Citizens should be engaged in the evaluation process through surveys, online forums, and public meetings. This *feedback* process allows for quickly addressing any issues and adapting solutions to emerging needs.

III.2.2.5 Adaptation and corrections

Monitoring is not a static activity, but a continuous cycle that requires adaptability. Based on the data collected and community evaluations, it is possible to review and modify the strategies and actions taken to ensure that the objectives are achieved effectively and sustainably.

The implementation and monitoring of an *Smart Village* project are two closely interconnected phases that allow transforming the vision into reality. The initial planning must be followed by concrete actions, with a strong focus on community participation, the use of technology, and sustainability. Continuous monitoring and the adaptation of strategies are essential to ensure that the project remains relevant and responds to the needs of the community and the territory. Therefore, the *business plan* is not just a strategic document, but an operational guide that enables the realization of a sustainable, inclusive Smart Village, in tune with its territorial vocation.

In addition to an excellent Business Plan, it is also necessary to develop a management protocol that considers how the various components should interface with each other. This will be elaborated in the next section.

Fig. III.2.2.5.1 | Petralia Sottana ©Letizia Cardinali, 2024.

EXECUTIVE SUMMARY

The goal of the smart village is to promote a sustainable development model that enhances local heritage, actively involves the community, and integrates advanced technologies to improve governance and services. This business plan aims to define the actions, costs, and investment potential to transform the village into a culturally active, tourist-friendly, and sustainable center, thereby attracting new economic opportunities.

PROJECT DESCRIPTIONS

The project involves an integrated approach that enhances the cultural and environmental heritage of the village, while also improving the quality of services and promoting a circular economy. The focus is on accessibility, digitalization of heritage, creation of cultural routes, and the promotion of social and sustainable initiatives.

MARKET ANALYSIS

- **Target Audience:** Local residents, cultural tourists, young entrepreneurs, rural area investors, training and research institutions, tourism operators.
- **Industry Trends:** Growing interest in sustainable tourism and immersive cultural experiences, development of technologies applied to the digitalization of villages and rural areas, and policies supporting the revitalization of small towns.

BUSINESS OBJECTIVES

- **Community and Participation:** Increase active community involvement in heritage management, with the goal of having 70% of residents participate in initiatives within the first three years.
- **Digitization and Technology:** Digitize at least 50% of the heritage within the second year, implementing monitoring technologies for structural preservation.
- **Sustainability and Tourism:** Increase tourist flow by 30% in the first three years, attracting cultural and sustainable tourists.
- **Local Employment:** Create job opportunities and form local cooperatives, reducing youth emigration and fostering the inclusion of new professions.

OPERATIONAL STRATEGY

A. Community and Participation

- Activities:
  - Organization of workshops, cultural events, and craft workshops.
  - Creation of community cooperatives for the management of cultural services.
- Costs:
  - Events and workshops: €...
  - Training and support for cooperatives: €.../year.
- Expected Results:
  - Creation of a local support network.
  - Growth in the sense of belonging and participation.

B. Governance and Partnerships

- Activities:
  - Development of local regulations for heritage protection.
  - Partnerships with private entities for co-financing cultural and technological initiatives..
- Costs:
  - Studies and strategic plans: €... one-time.
  - Partnership management: €.../year.
- Expected Results:
  - Strengthening of local governance.
  - Greater access to external funds and resources.

C. Technology and Digitization

- Activities:
  - Creation of a digital archive of heritage, accessible via an app.
  - Implementation of sensors and IoT technologies for monitoring and preventive maintenance.
- Costs:
  - Digital infrastructure and app: €...
  - Sensors and maintenance: €.../year.
- Expected Results:
  - Greater access to historical and cultural information.
  - Reduction in restoration and maintenance costs.

D. Valorizzazione del Patrimonio Materiale e Immateriale

- Activities:
  - Restoration of historic buildings, rehabilitation of basic construction, and creation of cultural routes.
  - Organization of annual events such as cultural festivals and exhibitions.
- Costs:
  - Recovery and maintenance: €.../year.
  - Promotion and tourism marketing: €.../year.
- Expected Results:
  - Increase in cultural tourism.
  - Preservation of cultural and environmental heritage.

Fig. III.2.2.5.2a | Business Plan for a Smart Villages ©Luisa Lombardo, 2024.

MARKETING STRATEGY

- **Digital Promotion:** Dedicated website and app with virtual tours and reservations for guided tours.
- **Collaboration with Travel Agencies:** Agreements to include the village in cultural tourism circuits.
- **Local Awareness Campaigns:** Educating the community about the importance of heritage enhancement, with communications on social media and local media channels.

SOURCES OF FUNDING

- **European and National Funds:** Searching for funding and grants at the European level to support digital infrastructure and restoration.
- **Partnerships with Private Entities and Sponsorships:** Collaborations with companies that can fund events and activities in exchange for visibility and networking opportunities.
- **General Revenue:** Entrance fees for events, guided tours, and contributions from local cooperatives.

FINANCIAL ANALYSIS

Cost Item	Annual Cost (€)
Community events and workshops	...
Training and support for cooperatives	...
Studies and strategic plans	...
Partnership Management	...
Digital Infrastructure and Apps	...
Sensors and Maintenance	...
Rehabilitation, Restoration, and Maintenance	...
Tourism Promotion and Marketing	...
Annual Total	**...**

EVALUATION AND MONITORING

- **KPI:** Monitoring of community engagement, tourist flow, technology usage, and environmental impact.
- **Quarterly Reviews:** Evaluation of progress, with potential adjustments to optimize the plan and adapt to new opportunities or challenges.

Fig. III.2.2.5.2b | Business Plan for a Smart Villages ©Luisa Lombardo, 2024.

III.2.3 Management protocol for the development of Smart Villages

To achieve a Smart Village, it is essential to follow a path inspired by the Smart Cities model, but adapted to the specific characteristics and needs of rural contexts. This process is structured into phases that consider parameters, objectives, and collaborative networks (*Fig. 1*).

The creation of a *Smart Village* requires an integrated strategy that includes multiple levels of action.

The collaborative network (Albino et al., 2015) is similar to that envisioned for Smart Cities: local and regional governments, businesses, universities, and the community. The government plays a crucial role in providing the necessary *governance* and promoting policies that support the adoption of technologies, social inclusion, and sustainability. Businesses, particularly those in the technology and infrastructure sectors, are essential for providing innovative solutions. Universities and research centers contribute through knowledge production, technological innovation, and training. The community, finally, must be actively involved in the transformation process, through participation in collective decisions, management of shared projects, and strengthening social capital.

First, it is essential to develop a solid infrastructure that enables the management and interconnection of the various systems present in the *Smart Village* (Barile et al., 2018). This involves, in addition to the aspects already considered in the collaborative network, health and safety indices and natural resources (Batagan, 2011). Collaboration between different actors, transparency in decision-making, and strengthening administrative capacities are fundamental aspects for the success of the project. These must then contribute to objectives to be achieved, namely ring 2.

To make rings 1 and 3 work, a collaborative network is needed to ensure that the actors of level 1 and the objectives of level 3 are reached.

There are no rigid time limits for creating a Smart Village. However, the transition must occur gradually, responding to the emerging needs of the area. The ideal moment to start the process is when the community and institutions are ready to undertake a path of change (Ciasullo et al., 2020), with a strong will to innovate and improve living conditions. The context must also be favorable, with political support, economic resources, and growing awareness of the need for transformation.

Although the concept of a *Smart Village* is designed for rural areas, each context has its peculiarities that influence the transformation process. The size of the community, existing infrastructure, level of technological development, and support from local institutions are factors that determine the feasibility and speed of the project. Areas with a good level of digitalisation and strong connections with European or national rural development policies are more likely to initiate and successfully sustain a *Smart Village* project (Komninos, 2016).

The path towards creating a Smart Village, therefore, requires a holistic approach that integrates technology, sustainability, and community. As with smart cities, *Smart Villages* also require integration between smart infrastructure, efficient *governance*, and strong community involvement. Only through cooperation between the public, private sectors, and citizens will it be possible to achieve lasting and meaningful transformation, contributing to the well-being of people and environmental sustainability. The result will be a more resilient, innovative rural community, prepared to face the challenges of the future.

On the next page, there will be an explanatory diagram of the Management Protocol for a Smart Village, useful for understanding the relational dynamics to be considered for a successful and exemplary village. Although starting from the Madonie context, it can be applied to other territorial contexts by analogy or contrast.

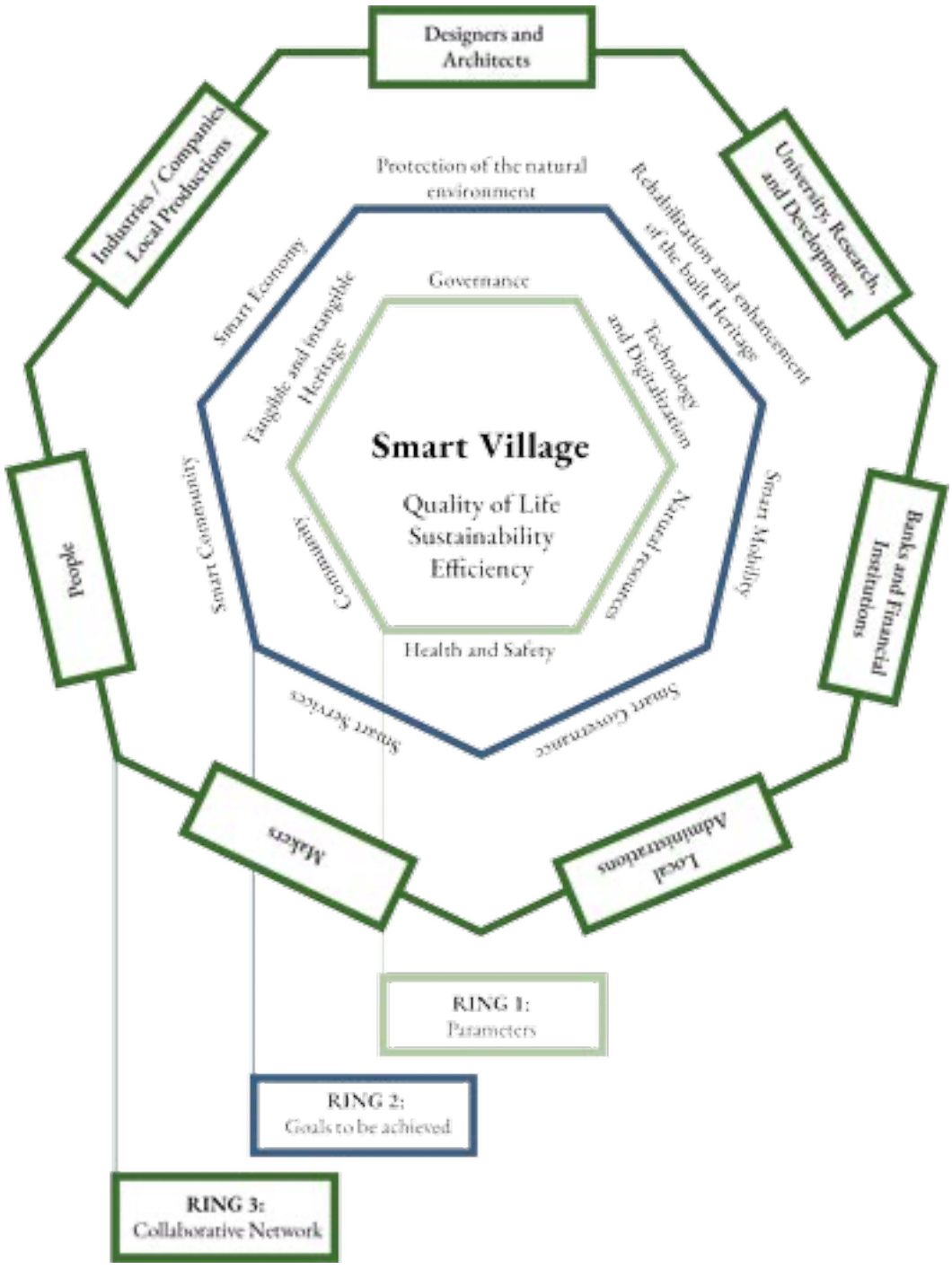


Fig. III.2.2.6.1 | Smart Village Management Protocol Diagram ©Luisa Lombardo, 2024.

Fig. III.2.2.6.2 | Management Protocol Indices ©Luisa Lombardo, 2024.

These indices shown in the figure are used to determine the necessary steps for developing a Smart Village in small territorial contexts. Starting from the SWOT analysis to the definition of an appropriate Management Protocol, it is possible to ensure the conscious development of an intelligent village. This ensures that each step taken is based on a solid methodology and appropriate, shared strategies.

III.3 A Smart network for the Madonie

The Madonie, with their 21 communities and municipalities spread across a unique landscape such as the UNESCO Geopark of the Madonie Park, represent a microcosm where history, nature, culture, and tradition intertwine with the challenges of modernity. The Smart Network for the Madonie undoubtedly begins as an ambitious project capable of promoting sustainable and integrated development based on collaboration and innovation. At the heart of it lies the principle of mutual aid: a system where the stronger municipalities act as a driving force for the weaker ones, yet the strength of the network lies in its ability to work together for a common goal: sustainability and the achievement of the SMART concept, specifically *Smart Villages*.

The construction of a Smart Network (Emerllahu et al., 2024) cannot be separated from the active involvement of the community, which must feel engaged and proactive in the change, as well as a promoter. The inhabitants of the Madonie are bearers of knowledge (Stain et al., 2022), experiences, and traditions that represent a fundamental resource for the development and future of the territories. Participation must occur through moments of exchange, *co-design* workshops, and association initiatives, forms of participatory democracy, assemblies, meetings, workshops, and focus groups dedicated to specific themes at a time, where ideas emerge from the bottom up and transform into concrete projects. It is through this participation that the territory can express its identity, enhance its specificities, and generate a sense of belonging.

The *governance* of a Smart Network must be inclusive, transparent, and effective in seizing funding and support opportunities (Zavranik et al., 2018). Through shared strategic planning, local administrations can intercept regional, national, and European funds, promoting interventions that respond to the specific needs of the territory. A collaborative approach involving public and private entities and citizens allows for maximizing available resources and ensuring sustainable and long-term interventions.

The cultural and natural heritage of the Madonie represents a key element for the revitalization of the area. The protection and rehabilitationof architectural and landscape heritage are not only conservation efforts but also opportunities to revitalize the economic and social fabric, while promoting both tradition and innovation. Similarly, intangible traditions—such as folk festivals, artisan knowledge, religious celebrations, and local stories—can be enhanced through events, tourist routes, and collective *storytelling* projects, turning the past into a resource for the future.

New technologies offer powerful tools to address the challenges of rural areas. Monitoring systems, sustainable energy management of built heritage, digital platforms for tourism and civic participation, applications for heritage enhancement, and local commerce are just a few of the possible solutions. Digitalisation can also improve access to essential services, reducing the gap between inner areas and urban centers (Zavranik et al., 2020). The future of the Madonie lies in the integration of innovative technologies that respect the identity of the territory.

The Smart Network for the Madonie that needs to be created must be

based on a balance between tradition and innovation. The projects developed must be rooted in local history and culture but open to new ideas and technologies. For example, the rehabilitationof an ancient smaller town can use traditional materials and techniques, integrating them with technological solutions for energy efficiency and connectivity. This approach allows for the enhancement of local resources while simultaneously stimulating new development opportunities.

To support the smart network and ensure that the Madonie communities have access to the necessary resources, it is essential to have the right tools. The Rural Toolkit[1] proposed by Europe serves as a comprehensive guide to European Union funding and support opportunities for rural areas, with direct applications, participation applications through national or regional authorities, and financial instruments. This guide provides detailed information on calls for proposals, programs, and European initiatives, offering concrete support for the design and implementation of interventions. A prepared and well-informed territory is a territory that can face the challenges of the future with greater awareness and determination (Satola et al., 2022). However, it is useful to start a thoughtful and conscious path that can systematize projects and processes in a sustainable and virtuous way. While the EU-promoted toolkit serves as an aid for *Smart Villages*, this research aims to initiate a programmatic path focused on identifying local specificities, rather than providing a collection of links for small rural areas. The hope is to provide adequate tools that can take into account the true essence of the territories, going beyond the generality of contexts and considering the uniqueness of each of them.

The Smart Network for the Madonie, as depicted in *Fig. 1*, is not just a project but a development vision aimed at transforming the territory into an example of sustainability, innovation, and cooperation. Thanks to mutual aid and inclusive *governance*, the Madonie can become a virtuous model for other rural areas, demonstrating that the strength of the community and the integration of the past and the future are the keys to lasting success.

Fig. III.1.1 | Polizzi Generosa in celebration ©Letizia Cardinali, 2024.

[1] *[...]The Rural toolkit is the comprehensive guide to EU funding and support opportunities for rural areas in the European Union. It aims to help local authorities, institutions and stakeholders, businesses and individuals to identify and take advantage of existing EU funds, programmes and other funding and support initiatives, and to foster development in rural territories. [...]*

[...] While not explicitly designed for rural development, numerous EU funding programs and initiatives can play a significant role in revitalising and enhancing the quality of life in rural areas. However, identifying the right source of funding or support and how to make the best use of it can be challenging.
The Rural toolkit aims to facilitate local institutions, businesses, associations and individuals in rural areas to navigate the diverse EU funding and support options, and to take full advantage of them.[...]

[...] The toolkit provides a unique entry point to all existing initiatives, with comprehensive information on available resources, and explains why these are relevant for rural areas.
Pactical examples featured on the platform encourage knowledge sharing and peer learning among rural communities. The Get inspired section offers insights on successful initiatives implemented in rural areas across the EU, and on how to combine EU funds effectively to maximise their impact and address specific local needs. Within the toolkit, users will find a range of valuable resources including handbooks and guidance on EU funding opportunities. These resources equip users and applicants with the knowledge and tools needed to address the unique challenges facing rural areas, with an effective, integrated and place-based approach. [...]

European Commission. (2024). Funding opportunities for rural areas. Retrieved November 20, 2024, from https://funding.rural-vision.europa.eu/?lng=en

Fig. III.1.2 | Polizzi Generosa from drone ©Carmelo Di Salvo, 2022.

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Conclusioni e Sviluppi Futuri
Conclusion and Future Developments

Nel corso dello sviluppo della presente Ricerca, l'analisi dello stato dell'arte, che ha incluso una revisione ampia della letteratura, delle esperienze e delle pratiche in ambito europeo ed extraeuropeo, si è rivelata fondamentale per comprendere le linee d'azione seguite nel recupero e valorizzazione delle aree interne. In particolare, le interviste condotte con esperti, amministratori locali, professionisti e membri delle comunità hanno permesso di raccogliere preziose informazioni su approcci, metodologie e risultati concreti, ampliando la comprensione del tema e contribuendo a una visione più approfondita e contestualizzata. Le interviste hanno, infatti, offerto uno spunto significativo per riflettere sull'evoluzione delle politiche territoriali, sulle sfide connesse all'implementazione delle tecnologie e sull'approccio di Ricercaapplicato a queste tematiche.

Particolare rilevanza è stata data allo studio di casi di successo a livello italiano ed europeo, che hanno fornito modelli operativi di recupero e valorizzazione sostenibile, evidenziando buone pratiche e soluzioni innovative. L'analisi di casi extraeuropei ha permesso di ampliare la prospettiva, portando alla luce approcci trasversali che mettono al centro il rapporto tra comunità locali, patrimonio e tecnologia, così come la necessità di una governance inclusiva e orientata alla sostenibilità. Questi esempi sono stati essenziali per delineare le traiettorie da seguire, adattandole alle specificità dei territori oggetto della ricerca.

L'esperienza acquisita nel tirocinio presso la Soprintendenza dei Beni Culturali e Ambientali di Palermo ha fornito una prospettiva operativa utile a comprendere come affrontare le problematiche legate alla gestione del patrimonio culturale, in particolare per quanto riguarda il patrimonio costruito che presenta condizioni di degrado, dissesto e vulnerabilità.

Un ulteriore valore aggiunto della Ricercaè stato l'approccio transnazionale, con l'esperienza di studio a Valencia, che ha arricchito il confronto internazionale. L'analisi dei modelli di *Smart Village* implementati in Spagna ha offerto spunti metodologici utili per adattare le soluzioni progettate alle specificità del contesto madonita. In particolare, l'osservazione dei modelli di sviluppo delle aree rurali in Spagna ha mostrato come le tecnologie digitali possano integrarsi efficacemente con il patrimonio locale, creando un equilibrio tra innovazione e tradizione.

In sintonia con gli obiettivi di questo studio, l'output principale elaborato è stato un atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie. L'atlante raccoglie, in

During the development of this research, the analysis of the state of the art, which included an extensive review of literature, experiences, and practices in both European and non-European contexts, proved fundamental to understanding the approaches adopted in the rehabilitation and enhancement of inner areas. In particular, interviews conducted with experts, local administrators, professionals, and community members provided valuable insights into approaches, methodologies, and concrete outcomes, broadening the understanding of the topic and contributing to a more in-depth and contextualized vision. These interviews offered significant input for reflecting on the evolution of territorial policies, the challenges associated with the implementation of technologies, and the applied research approach to these themes.

Special emphasis was placed on the study of successful cases at both the Italian and European levels, which provided operational models for sustainable rehabilitation and enhancement, highlighting best practices and innovative solutions. The analysis of non-European cases further broadened the perspective, shedding light on cross-cutting approaches that prioritize the relationship between local communities, heritage, and technology, as well as the need for inclusive and sustainability-oriented governance. These examples were essential in outlining trajectories to be followed, adapting them to the specificities of the territories examined in the research.

The experience gained during the internship at the Superintendence for Cultural and Environmental Heritage of Palermo provided a practical perspective on addressing the issues related to the management of cultural heritage, particularly regarding built heritage in conditions of decay, instability, and vulnerability.

An additional added value of this research was the transnational approach, enriched by the study experience in Valencia. The analysis of Smart Village models implemented in Spain offered methodological insights useful for adapting the proposed solutions to the specific context of the Madonie region. Specifically, the observation of rural development models in Spain demonstrated how digital technologies can effectively integrate with local heritage, creating a balance between innovation and tradition.

Aligned with the objectives of this study, the primary output was an atlas of technological solutions for the rehabilitation and enhancement of the inner areas of

forma sistematica e organica, le migliori pratiche tecnologiche, che spaziano dall'uso di strumenti digitali per la gestione dei beni culturali e naturali, all'implementazione di soluzioni innovative per migliorare la qualità della vita delle comunità locali. In particolare, sono state selezionate e analizzate soluzioni che favoriscono l'integrazione tra tradizione e innovazione, promuovendo la sostenibilità e l'efficienza nonchè la compatibilità degli interventi. L'atlante offre un'utile guida per la pianificazione territoriale, fornendo riferimenti concreti per amministratori, tecnici e altri stakeholder impegnati nel recupero e nella valorizzazione delle aree interne.

Parallelamente, è stato sviluppato un caso pilota incentrato sul comune di Polizzi Generosa, che ha visto l'elaborazione di linee guida specifiche per il recupero e la valorizzazione del territorio. Queste linee guida, che hanno tratto spunto dall'esperienza all'estero a Valencia e dai manuali comunemente elaborati per la Comunità Valenciana, si fondano su un approccio partecipativo, che coinvolge direttamente la comunità locale nel processo di progettazione e attuazione delle azioni, in modo da rispondere in modo mirato e congruo alle esigenze reali del territorio e, al contempo, conoscere e analizzare le peculiarità territoriali fornendo una proposte e dunque un progetto di recupero per il contesto in esame. Le linee guida, che comprendono strategie per il recupero del patrimonio architettonico, il miglioramento dei servizi locali e la promozione della cultura e del turismo, costituiscono un modello applicabile ad altri comuni delle Madonie, ma anche a contesti simili in altre aree interne.

La Ricerca si è sviluppata all'interno di un quadro metodologico complesso e mirato, orientato a promuovere la valorizzazione dei territori marginali, in particolare quelli appartenenti alle cosiddette "aree interne" o "territori interni". Questi spazi, seppur spesso caratterizzati da uno stato di marginalità socio-economica, possiedono un patrimonio culturale, storico e ambientale che rappresenta un valore irrinunciabile, fondamentale per il futuro delle comunità locali e per lo sviluppo di strategie di crescita sostenibile. La sfida che queste aree pongono va ben oltre il problema dello spopolamento e delle carenze infrastrutturali, e riguarda la preservazione della loro identità tradizionale e culturale, minacciata dai processi di globalizzazione. Questo studio ha esplorato le opportunità di recupero e rilancio di tali aree, facendo leva sulla loro unicità e sui potenziali di sviluppo che risiedono in un'integrazione tra tradizione e innovazione.

Il cuore metodologico della Ricercaè stato l'approccio transdisciplinare, che ha permesso di affrontare la complessità dei territori interni con un'ottica che non si limita a un singolo campo disciplinare, ma abbraccia numerosi ambiti, nonchè il contatto con i territori e l'esperienza diretta di progettazione vivendo a stretto contatto con i territori. L'adozione di un approccio multidisciplinare e diretto ha consentito di analizzare le aree interne in relazione non solo ai loro aspetti fisici e ambientali, ma anche alle dinamiche sociali, culturali ed economiche. Questa metodologia ha reso possibile la definizione di interventi e tecnologie mirati e integrati, in grado di rispondere simultaneamente a più esigenze e di sfruttare le risorse esistenti.

the Madonie Park. The atlas systematically and comprehensively collects the best technological practices, ranging from the use of digital tools for the management of cultural and natural heritage to the implementation of innovative solutions aimed at improving the quality of life for local communities. In particular, the selected and analyzed solutions promote the integration of tradition and innovation, advancing sustainability, efficiency, and the compatibility of interventions. The atlas serves as a valuable guide for territorial planning, providing concrete references for administrators, technicians, and other stakeholders engaged in the rehabilitation and enhancement of inner areas.

In parallel, a pilot case study focused on the municipality of Polizzi Generosa was developed, resulting in the creation of specific guidelines for the rehabilitation and enhancement of the territory. These guidelines, inspired by the experience in Valencia and the manuals commonly developed for the Valencian Community, are based on a participatory approach that directly involves the local community in the design and implementation of actions. This ensures a targeted and coherent response to the real needs of the area while allowing for the analysis of its territorial specificities and the development of rehabilitation proposals tailored to its context.

The guidelines include strategies for the restoration of architectural heritage, the improvement of local services, and the promotion of culture and tourism. They represent a model that can be applied to other municipalities in the Madonie region, as well as to similar contexts in other inner areas.

The research was conducted within a complex and targeted methodological framework aimed at promoting the enhancement of marginal territories, particularly those identified as "inner areas" or "remote territories." These areas, despite often being characterized by socio-economic marginalization, possess cultural, historical, and environmental heritage that represents an invaluable asset essential for the future of local communities and the development of sustainable growth strategies. The challenges these territories face go well beyond the issues of depopulation and infrastructure deficits, encompassing the preservation of their traditional and cultural identity, which is increasingly threatened by globalization processes. This study has explored opportunities for the rehabilitation and revitalization of such areas, leveraging their uniqueness and developmental potential through an integration of tradition and innovation.

The methodological core of the research was a transdisciplinary approach that enabled the complex nature of inner territories to be addressed through a perspective that transcends a single disciplinary field, embracing multiple domains and fostering direct engagement with the territories through immersive design experiences. The adoption of a multidisciplinary and hands-on approach allowed for an in-depth analysis of inner areas, considering not only their physical and environmental characteristics but also their social, cultural, and economic dynamics. This methodology facilitated the identification of targeted and integrated interventions and technologies

L'approccio multiscalare ha permesso di porre il focus sul caso studio delle Madonie, ma anche di estendere lo sguardo a livello nazionale, europeo e dunque anche del Bacino del Mediterraneo, confrontandosi con esperienze simili e migliorando la comprensione delle soluzioni più adeguate per queste realtà. Inoltre, la dimensione multitemporale ha permesso di tracciare l'evoluzione storica di questi territori, evidenziando non solo la loro marginalità, ma anche i cambiamenti socioculturali, economici e politici che hanno contribuito alla loro attuale condizione.

Un concetto centrale della Ricercaè stato quello dello "*Smart Village*", che non viene interpretato come un semplice ricorso alla tecnologia, ma come un approccio globale e integrato che coniuga innovazione, sostenibilità e rispetto delle tradizioni locali, ma soprattutto connessione e mutua collaborazione. In questo contesto, il caso delle Madonie si è rivelato esemplare, in quanto ha mostrato come territori caratterizzati da un significativo ritardo infrastrutturale possano, comunque, offrire ampie risorse naturali, culturali e sociali sfruttando le risorse locali, le peculiarità e la vocazione territoriale trasformandola in volano per uno sviluppo condiviso e sostenibile. Le soluzioni proposte per la creazione di *Smart Villages* in queste aree si sono concentrate sulla coesione sociale, sull'integrazione delle nuove tecnologie con il patrimonio storico e culturale e sull'ampliamento della qualità della vita, con particolare attenzione alla sostenibilità ambientale. L'approccio Smart deve essere visto come un'integrazione di sistemi tecnologici avanzati con un attento recupero e valorizzazione delle risorse architettoniche, storiche e culturali locali, al fine di migliorarne la fruizione e l'efficienza e contribuire allo sviluppo delle aree nonché al loro ripopolamento.

La Ricerca ha anche sottolineato la necessità di una combinazione di azioni in grado di promuovere una *governance* locale che adotti un approccio inclusivo, basato sulla partecipazione attiva delle comunità. Il coinvolgimento dei cittadini nelle decisioni politiche e amministrative è stato identificato come uno degli aspetti chiave per il successo delle politiche di recupero e valorizzazione delle aree interne. La gestione delle risorse naturali e culturali deve essere accompagnata, infatti, da un'efficace pianificazione territoriale, che promuova una sinergia tra la tradizione e le tecnologie innovative.

Nonostante i progressi emersi, la Ricerca ha anche messo in evidenza alcune criticità, tra cui la frammentazione delle politiche pubbliche e la carenza di risorse finanziarie. In particolare, l'approccio competitivo adottato da strumenti normativi come la Strategia Nazionale per le Aree Interne (SNAI) e il Piano Nazionale di Ripresa e Resilienza (PNRR) potrebbe accentuare le disuguaglianze territoriali, limitando l'efficacia delle politiche destinate alle aree interne. In questo contesto, è emersa la necessità di una governance più inclusiva, che adotti una visione integrata e partecipativa, capace di garantire un uso più efficace delle risorse disponibili e una pianificazione strategica condivisa, considerando soprattutto l'aspetto e l'impatto economico a lungo, medio e breve termine.

Un altro aspetto cruciale per il futuro delle aree interne riguarda il capitale sociale e ambientale, elementi indispensabili per il raggiungimento di uno sviluppo equilibrato e

capable of addressing multiple needs simultaneously while harnessing existing resources.

The multiscale approach enabled the research to focus on the case study of the Madonie region while extending its scope to national, European, and Mediterranean contexts. This comparative analysis with similar experiences provided insights into the most appropriate solutions for these realities. Additionally, the multitemporal dimension allowed for a historical exploration of these territories, highlighting not only their marginalization but also the socio-cultural, economic, and political transformations that have shaped their current conditions.

A central concept of the research was the "Smart Village," not merely as a technological solution but as a holistic and integrated approach that combines innovation, sustainability, and respect for local traditions, emphasizing connectivity and mutual collaboration. In this context, the Madonie region proved to be an exemplary case, demonstrating how territories with significant infrastructural delays can nevertheless offer substantial natural, cultural, and social resources. By capitalizing on local assets, territorial uniqueness, and vocation, these resources can be transformed into catalysts for shared and sustainable development.

The proposed solutions for creating Smart Villages in these areas focused on social cohesion, integrating new technologies with historical and cultural heritage, and improving the quality of life, with particular attention to environmental sustainability. The Smart approach must be seen as a synergy between advanced technological systems and the careful rehabilitation and enhancement of local architectural, historical, and cultural resources. This integration aims to improve accessibility and efficiency while contributing to the development and repopulation of these areas.

The research also emphasized the need for a combination of actions to promote local governance that adopts an inclusive approach based on active community participation. Citizen involvement in political and administrative decisions was identified as one of the key aspects for the success of policies aimed at the rehabilitation and enhancement of inner areas. The management of natural and cultural resources must be accompanied by effective territorial planning that fosters synergy between tradition and innovative technologies.

Despite the progress highlighted, the research also pointed out certain critical issues, including the fragmentation of public policies and the lack of financial resources. In particular, the competitive approach adopted by regulatory tools such as the National Strategy for Inner Areas (SNAI) and the National Recovery and Resilience Plan (PNRR) could exacerbate territorial inequalities, limiting the effectiveness of policies targeting inner areas. In this context, the need for more inclusive governance emerged, calling for an integrated and participatory vision capable of ensuring a more effective use of available resources and shared strategic planning, with particular attention to the short-, medium-, and long-term economic impacts.

Another crucial aspect for the future of inner areas

duraturo. La Ricerca ha suggerito che solo attraverso una valorizzazione continua delle risorse architettoniche, naturali, culturali e sociali locali, e un forte coinvolgimento delle comunità, sarà possibile realizzare una crescita che rispetti le peculiarità di ciascun territorio, promuovendo al contempo la sostenibilità. L'implementazione di piattaforme digitali che facilitano la comunicazione e la collaborazione tra cittadini e amministrazioni potrebbe essere una strategia vincente per incrementare la partecipazione civica e migliorare la gestione delle politiche pubbliche.

Guardando al futuro, questa Ricercaha aperto numerose possibilità di sviluppo in ambiti diversi, dall'integrazione di tecnologie applicabili all'uso di energie rinnovabili alla mobilità intelligente, dall'evoluzione della governance alla conservazione e al recupero del patrimonio. La combinazione di innovazione tecnologica, sostenibilità ambientale e partecipazione attiva delle comunità rappresenta una strada promettente per lo sviluppo delle aree interne. Con l'adozione di un approccio integrato e multidisciplinare, le aree rurali potrebbero trasformarsi in modelli di sviluppo sostenibile replicabili non solo in Italia, ma in tutto il Bacino del Mediterraneo.

Questa ricerca apre a molteplici sviluppi futuri, che potrebbero essere esplorati per approfondire e ampliare gli ambiti di indagine relativi al recupero e alla valorizzazione delle aree interne. Un primo ramo di ricerca potrebbe focalizzarsi sull'integrazione avanzata delle tecnologie digitali con il patrimonio architettonico e naturale, con particolare attenzione alla creazione di modelli predittivi per la manutenzione e il recupero dei beni architettonici, basati su sistemi di monitoraggio e intelligenza artificiale; questo approccio consentirebbe di prevedere criticità strutturali e ottimizzare le risorse disponibili.

L'analisi attraverso un Indice, così come è stato fatto per le Smart Cities, che individui il livello di Smartness territoriale evidenziando le strategie da intraprendere.

Un altro filone promettente riguarda l'applicazione di tecnologie sostenibili, come l'utilizzo di energie rinnovabili nei contesti rurali, non solo per promuovere l'autosufficienza energetica, ma anche per integrare queste soluzioni nel recupero di edifici storici, garantendo la compatibilità tra innovazione e tradizione. A ciò si affianca la possibilità di indagare la mobilità intelligente, mirata a potenziare i collegamenti tra aree interne e centri urbani, attraverso soluzioni di trasporto condiviso e a basso impatto ambientale. Un ulteriore ambito di ricerca potrebbe esplorare modelli innovativi di governance partecipativa, con l'obiettivo di studiare strumenti e piattaforme digitali in grado di rafforzare il dialogo tra amministrazioni e cittadini, migliorando l'efficacia delle politiche pubbliche e incrementando il capitale sociale delle comunità locali. Parallelamente, sarebbe utile sviluppare studi approfonditi sulle forme di associazionismo comunitario, come le cooperative di comunità, che rappresentano una leva strategica per lo sviluppo economico locale e la valorizzazione delle risorse endogene.

In una prospettiva multidisciplinare, un filone di ricerca interessante potrebbe riguardare l'analisi del rapporto tra patrimonio culturale e cambiamenti climatici, indagando strategie innovative per rendere i territori più resilienti a eventi estremi, preservando al contempo la loro identità

concerns their social and environmental capital, essential elements for achieving balanced and sustainable development. The research suggested that only through the continuous enhancement of local architectural, natural, cultural, and social resources, combined with strong community involvement, will it be possible to achieve growth that respects the unique characteristics of each territory while promoting sustainability. The implementation of digital platforms that facilitate communication and collaboration between citizens and administrations could be a winning strategy for increasing civic participation and improving the management of public policies.

Looking to the future, this research has opened up numerous possibilities for development in various fields, ranging from the integration of technologies for renewable energy use to smart mobility, from governance evolution to the conservation and rehabilitation of heritage. The combination of technological innovation, environmental sustainability, and active community participation represents a promising path for the development of inner areas. By adopting an integrated and multidisciplinary approach, rural areas could transform into models of sustainable development replicable not only in Italy but throughout the Mediterranean Basin.

This research opens up multiple future developments that could be explored to deepen and expand the areas of investigation related to the rehabilitation and enhancement of inner areas. A first line of research could focus on the advanced integration of digital technologies with architectural and natural heritage, with particular attention to the creation of predictive models for the maintenance and rehabilitation of architectural assets, based on monitoring systems and artificial intelligence; this approach would allow for the prediction of structural criticalities and optimization of available resources.

Analysis through an index, as done for Smart Cities, could identify the level of territorial smartness, highlighting the strategies to be undertaken.

Another promising line involves the application of sustainable technologies, such as the use of renewable energy in rural contexts, not only to promote energy self-sufficiency but also to integrate these solutions into the rehabilitation of historic buildings, ensuring compatibility between innovation and tradition. This could be complemented by the possibility of investigating smart mobility, aimed at enhancing connections between inner areas and urban centers, through shared and low-environmental-impact transport solutions.

A further research area could explore innovative models of participatory governance, with the aim of studying tools and digital platforms that strengthen the dialogue between administrations and citizens, improving the effectiveness of public policies and increasing the social capital of local communities. Simultaneously, it would be valuable to develop in-depth studies on forms of community associationism, such as community cooperatives, which represent a strategic lever for local economic development and the enhancement of endogenous resources.

From a multidisciplinary perspective, an interesting research line could focus on analyzing the relationship

storico-culturale. Ciò potrebbe includere studi sull'impiego di materiali locali e tecniche costruttive tradizionali, reinterpretate in chiave contemporanea, per migliorare le prestazioni energetiche e la durabilità degli interventi.

Lo sviluppo di una rete internazionale di *Smart Villages*, infine, rappresenta un'opportunità di ricerca rilevante, che potrebbe mettere in relazione esperienze diverse a livello globale, favorendo uno scambio di buone pratiche e soluzioni replicabili. Tale rete potrebbe anche supportare la creazione di un modello condiviso di gestione integrata delle risorse, promuovendo una visione olistica dello sviluppo rurale e incentivando la cooperazione tra territori con caratteristiche e sfide simili.

I possibili sviluppi futuri si configurano come un intreccio di percorsi complementari, che combinano innovazione tecnologica, sostenibilità ambientale e valorizzazione del capitale umano e culturale, delineando un quadro di ricerca orientato a una crescita equilibrata e duratura delle aree interne, ma soprattutto che non rendano vana questa Ricerca.

between cultural heritage and climate change, exploring innovative strategies to make territories more resilient to extreme events, while preserving their historical and cultural identity. This could include studies on the use of local materials and traditional building techniques, reinterpreted in a contemporary light, to improve energy performance and the durability of interventions.

Finally, the development of an international network of Smart Villages represents a significant research opportunity, which could connect different experiences globally, fostering an exchange of best practices and replicable solutions. This network could also support the creation of a shared model for integrated resource management, promoting a holistic vision of rural development and encouraging cooperation between territories with similar characteristics and challenges.

Possible future developments appear as an interweaving of complementary paths, combining technological innovation, environmental sustainability, and the enhancement of human and cultural capital, outlining a research framework aimed at a balanced and lasting growth of inner areas, but above all, one that ensures this research does not go to waste.

Fig. 1 | Inside the Madonie Park ©Quelli del Parco delle Madonie, 2023.

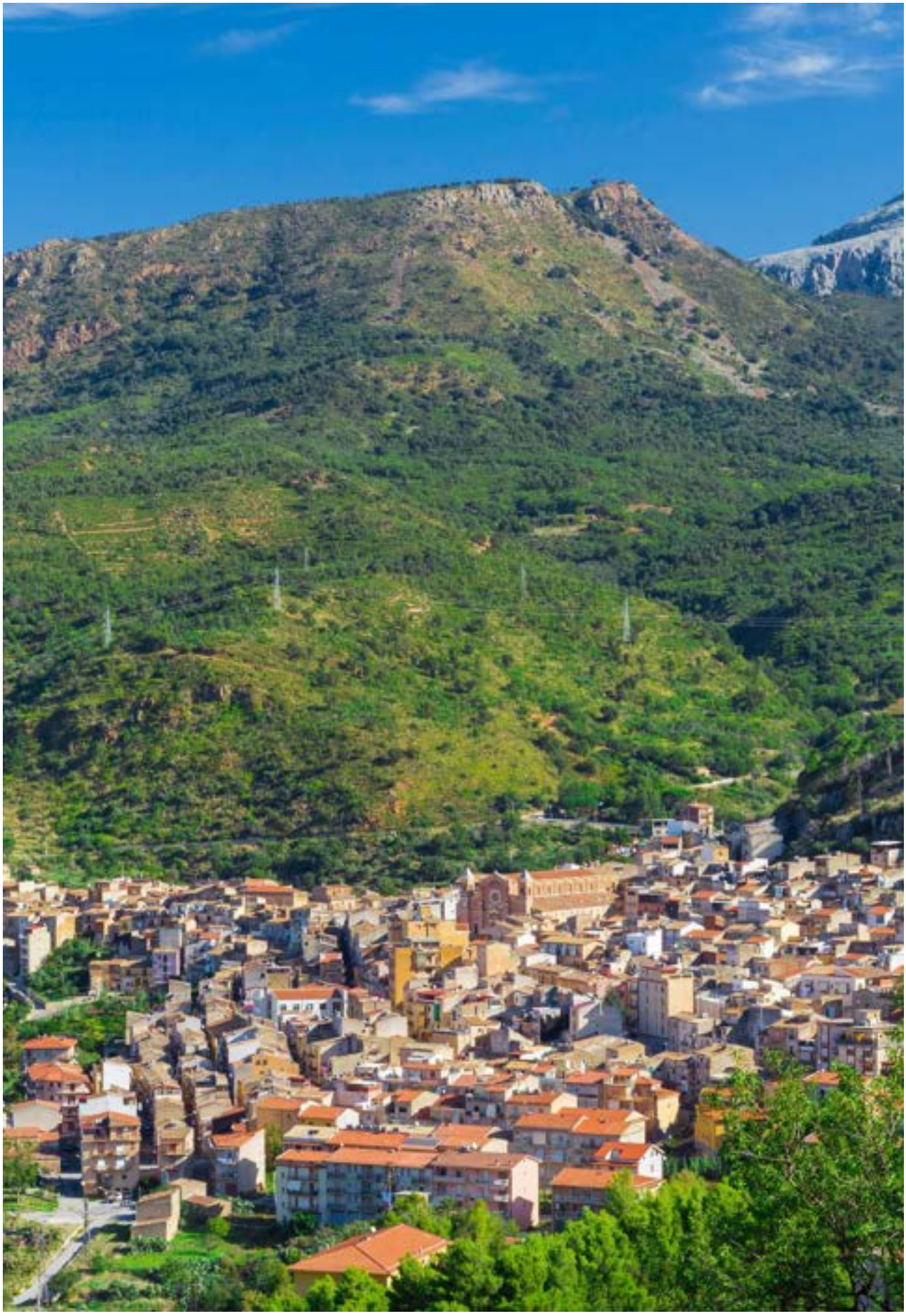

Fig. 2 | Collesano from the drone, one of the 21 municipalities of the Madonie ©Quelli del Parco delle Madonie, 2024.

Interviews

In recent years, a significant part of the research and practical efforts has focused on exploring the dynamics of projects for the rehabilitationand enhancement of inner areas, both in Italy and internationally. To learn from the meaningful experiences conducted in small rural towns, in-depth interviews were carried out with professionals in the field, including technicians and university professors, in order to understand how the problems related to improving conditions in these regions have been addressed and resolved. Most of the interviews were conducted with experts who have dedicated their efforts to European projects and PRIN Projects, focusing on the realities of small rural centers and considering various approaches, both technological and social. Additionally, professional figures, such as technicians, who have implemented interventions not only in the architectural field but also in the structural one, were involved. Some of them contributed to the production of rehabilitationmanuals, which are essential for enhancing and preserving the identity and cultural heritage of these centers.

The collection of all these interviews, conducted over the years, has represented a crucial starting point for the drafting of this thesis. The constant support received throughout this journey has played a fundamental role in enriching the research conducted over these three years. In this regard, I would like to express my heartfelt gratitude to all those who contributed to this work: to the professors and professionals who, with their experience and availability, provided me with valuable insights; to the technicians and participants in the interviews, whose field experience made an indispensable contribution to the quality of this study. In particular, I thank the members of European and PRIN projects, who shared their vision with me on the future of inner areas and on the role of research and innovation in these territories.

This thesis takes into account all the involved parties, aiming to highlight the multidisciplinarity and the inclusive and holistic approach adopted in the research. This approach was essential for addressing the complexity of the challenges in inner areas, with a particular focus on the Madonie region in Sicily. The goal is to adopt a large-scale vision that takes into account the cultural, social, and economic specificities of these regions.

The investigation carried out through the interviews, along with the continuous contribution from professors, professionals, and technicians, provided a solid foundation for the research and offered interesting stimuli for further study and reflection. The hope is that this study can contribute to promoting positive and sustainable change in inner areas, addressing challenges in an integrated and cohesive manner.

Prof. Pierfrancesco Fiore
Associate Professor in Architectural Engineering
Scientific-disciplinary Sector: ICAR/10
Department of Civil Engineering
University of Salerno

Prof. Antonella Guida
Full Professor in Architectural Engineering
Scientific-disciplinary Sector: ICAR/10
Department of European and Mediterranean Cultures - DiCEM
University of Basilicata (USB)

Prof. Ivano Scotti
Researcher in Sociology of the Environment and Territory
Scientific-disciplinary Sector: SPS/10
Department of Social Sciences
University of Naples Federico II

Prof. Giancarlo Carnevale
Professor Emeritus of Architectural Design
Scientific-disciplinary Sector: ICAR/14
Faculty of Architecture
Iuav University of Venice

Prof. Montserrat Bosch Gonzalez
Associate Professor of Architectural Technology
Department of Architectural Technology
Faculty of Architecture
Polytechnic University of Barcelona

Prof. Camilla Mileto
Full Professor
School of Architecture
Department of Architectural Composition
Polytechnic University of Valencia

Prof. María Josefa Balaguer Dezcallar
Associate Professor
School of Architecture
Department of Architectural Composition
Polytechnic University of Valencia

Ing. Daniele Torrecchia
Structural Engineer - RUP (Responsible for the Procedural Process) and Technical Manager
Region of Abruzzo

Arch. Pasqual Herrero
Project Manager at the studio El fabricante de espheras
Architecture firm in the historic center of Valencia
(http://www.elfabricantedeespheras.com/)

Interviews with experts from various fields provided a rich and comprehensive overview of the strategies and practices useful for the recovery, enhancement, and transformation of inner territories, with a particular focus on the importance of community participation, technological innovation, and training. Ivano Scotti, a sociologist, emphasized the importance of a structured approach that includes three fundamental phases: the preliminary study of the socio-cultural context, the creation of an ecosystem of public and private actors, and the activation of pilot cases, where practical experience serves as a testing ground for applying innovative solutions. He stressed the need to involve a diverse network of actors, including local administrators, Park authorities, universities, farmers, and associations, to build a shared project that could foster the revival of small towns through an integrated and sustainable *governance* model. Scotti also highlighted the necessity of mapping virtuous municipalities and establishing a territorial network involving at least 4-5 municipalities with common characteristics, without the need to involve the entire territory.

On the side of technology and training, engineer Torrecchia analyzed the challenges that emerged in the reconstruction of the towns of L'Aquila after the earthquake, highlighting the complete lack of specific training for structural interventions, necessary to avoid collateral damage and ensure the safety of buildings. In this context, he raised the issue of the shortage of skills in the construction and structural fields, proposing the urgent need to create ad hoc training programs for professionals in the sector and local administrators, in order to develop more conscious and targeted interventions. The engineer also emphasized the need to adopt lightweight and reversible technologies, which could meet the rehabilitationneeds without altering the historical and cultural identity of the places.

In parallel, Professor Giancarlo Carnevale suggested a training model focused on the "rebirth" of inner areas, centered on the creation of a widespread educational system that, through meetings, conferences, and zero-cost activities, could promote intellectual production and stimulate innovation. Carnevale also suggested adopting lightweight technologies to be used as "prostheses" in protected contexts, where invasive interventions would be difficult to accept or implement. He proposed, moreover, avoiding the fragmentation of spaces and instead focusing on the use of extended spaces, creating a "distributed university" that could reach even the most remote residences through accessible guidelines. In this way, training would not only be for technicians but for a broader audience, with the goal of stimulating a cultural change and raising awareness among citizens.

Professor Montserrat Bosch González provided a practical example with the Barcelona Technologies Manual, a tool that allows users to understand how their daily actions, particularly those related to technology use, can have social, economic, and environmental impacts. This manual is not only an educational tool but also a way to stimulate change in daily behaviors, helping people make more conscious decisions about their impact on the territory. Bosch González also mentioned an academic project related to inner areas, the output of which consists of a master's program that combines the protection and enhancement of territories, with the goal of creating replicable models focused on the sustainable rehabilitationof resources.

Professor Camilla Mileto provided further *insight* with her manuals for the rehabilitationof protected assets, drafted for Valencian contexts. These manuals, commissioned by the Comunitat Valenciana, focus on enhancing small territories through interventions that respect and protect the existing heritage, offering guidelines for a sustainable approach to the conservation and enhancement of cultural assets. In particular, Mileto stressed the importance of considering the specific context of each territory, avoiding standardized approaches, and instead focusing on solutions that respond to the peculiarities of each area.

Meanwhile, Professor Pepa Balaguer presented the Peñíscola Manual, another example of how a "smart" approach to heritage enhancement can

be implemented in a participatory way. This manual was developed not only for technicians but also for citizens, inviting them to become active participants in the processes of restructuring and recovering architectural heritage. Balaguer emphasized that citizen education is crucial to ensuring that heritage enhancement is not only a technical operation but a collective process that involves all members of the community.

Architect Pasqual Herrero, finally, presented examples of rehabilitation-projects in Valencia, focusing on the importance of adopting an innovative approach that does not abandon the protection of the territory and landscape. Herrero stressed that, while using modern technologies, every intervention must respect the cultural and landscape identity of the place, seeking to integrate innovation with tradition harmoniously.

The company eTowns presented a systemic and participatory approach to the rehabilitationand enhancement of territories, connecting citizens, administrations, and *stakeholders* to develop concrete solutions for economic, social, and environmental sustainability. The eTowns approach focuses on creating collaborative platforms that involve all *stakeholders*, promoting active participation and *co-design* for the future of territories. This model aims to stimulate social innovation and ensure that every intervention is sustainable and shared by the entire community.

The interviews with Prof. Pierfrancesco Fiore and Prof. Antonella Guida provided two fundamental contributions to guide and deepen the research. The discussion with Prof. Fiore allowed for outlining the complexity of the issues related to inner areas, focusing on the need for a strategic and synthetic vision that integrates multidisciplinary approaches. His suggestions, centered on the importance of considering cultural, environmental, and social aspects, as well as risk analysis and the evaluation of local peculiarities, enriched the methodological approach of the thesis. Moreover, the emphasis on the concept of "living" as innovation, linked to the context and the enhancement of the characteristic elements of the territory, provided crucial *insights* for developing a model of *smart village* consistent with the considered reality.

On the other hand, the dialogue with Prof. Guida introduced a highly technological and innovative perspective. Thanks to her experience in Smart Cities and Smart Heritage projects, it was possible to delve into the application of technologies for restoration, digitalisation, and the creation of digital passports for local materials. Additionally, the focus on experiences such as the village of Craco and the integration of gamification activities inspired a reflection on the importance of combining heritage protection with advanced technological tools to promote greater accessibility and engagement. Her suggestions regarding experimental consolidation and restoration techniques, such as cryo-cleaning, provided an important foundation for addressing issues related to the preservation of heritage in historic centers.

These interviews offer a detailed and complex view of the potential and challenges related to the enhancement of inner territories, highlighting the need for integrated approaches that combine training, technologies, community participation, and respect for heritage, in order to promote sustainable and inclusive development.

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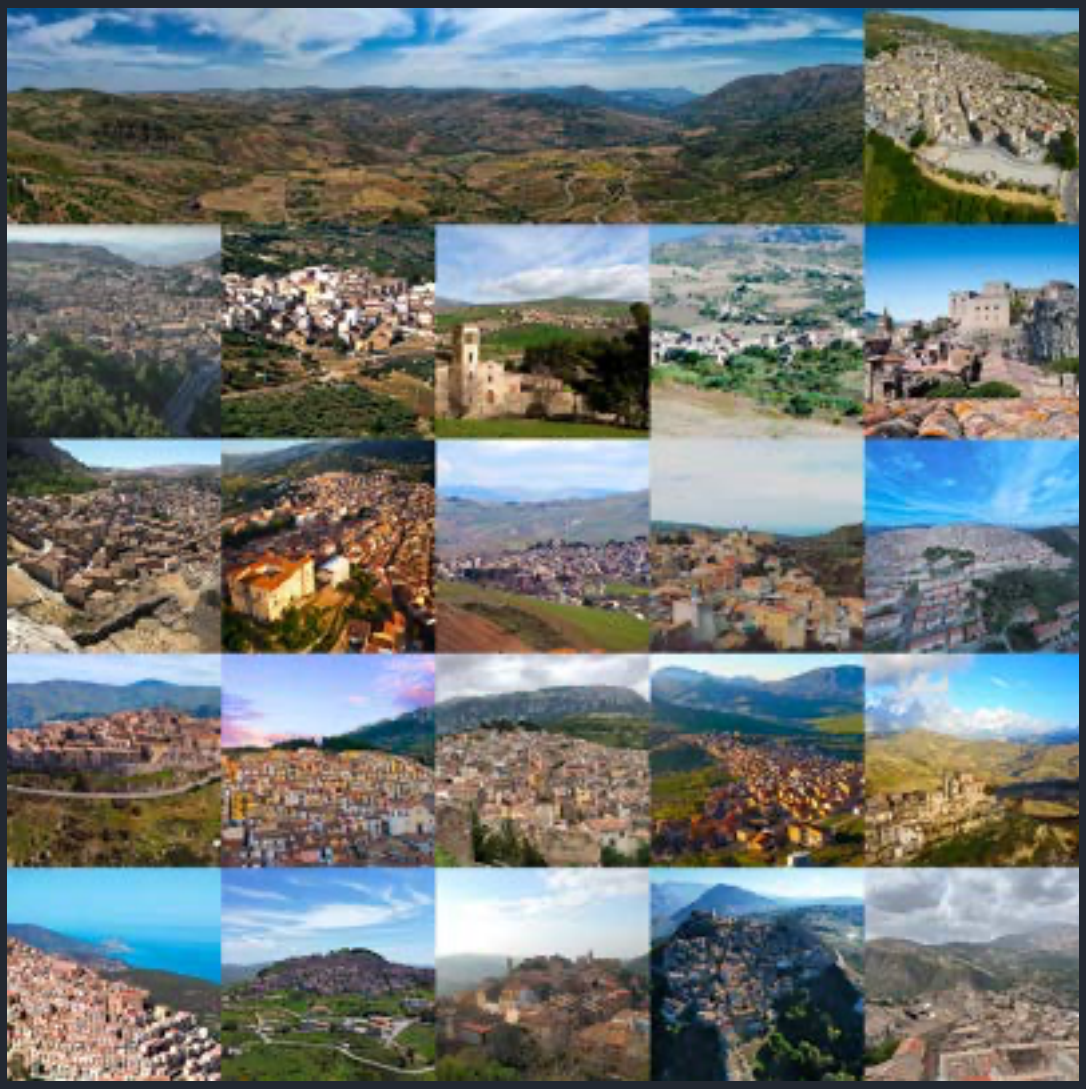
Università degli Studi di Palermo | Dipartimento di Architettura
Dottorato di Ricerca in "Architettura, Arti e Pianificazione"
Coordinatore: Prof. Arch. Marco Rosario Nobile

CENTRI MINORI INTELLIGENTI NEL PARCO DELLE MADONIE IN SICILIA

STRATEGIE DI RECUPERO E VALORIZZAZIONE DELLE AREE INTERNE



Dottoranda: Ing. Luisa Lombardo
Tutor: Prof. Ing. Ph.D. Tiziana Campisi
Co-Tutor: Prof. Arch. Ph.D. Simona Colajanni
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architettura Tecnica
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Dipartimento di Architettura (DARCH)
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architettura Tecnica

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IL DOTTORE
Ing. Luisa Lombardo

IL COORDINATORE
Prof. Arch. Marco Rosario Nobile

IL TUTOR
Prof. Ing. Ph.D. Tiziana Campisi

Il Tutor della SopriPa
Arch. Delia Geraci

IL CO-TUTOR
Prof. Arch. Ph.D. Simona Colajanni

Il Tutor (R+)
Prof. Arturo Zaragozá Catalán
Co-Tutor (UPV)
Prof. Rafael Marín Sánchez

CICLIO XXXVII
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...senza fretta, ma senza sosta.

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Acronimi e Abbreviazioni

ABAR - Archeologia, Belle Arti e Paesaggio: Settori di tutela del patrimonio culturale sotto il Ministero della Cultura (MIC).

APS - Associazione di Promozione Sociale: Organizzazione senza scopo di lucro per finalità sociali.

GAL - Gruppi di Azione Locale: Strumenti per lo sviluppo locale nel quadro del Programma Leader.

GDP - Gross Domestic Product

GTF - Green Transition Fund: Strumenti e risorse per la transizione ecologica.

DOP - Denominazione di Origine Protetta: Certificazione europea per prodotti agricoli e alimentari di qualità legata al territorio.

DPCM - Decreto del Presidente del Consiglio dei Ministri: Strumento normativo emanato dal Governo italiano.

EU - European Union.

EC - European Commission.

ENDR - European Network of Defence-related Regions.

FESR - Fondo Europeo di Sviluppo Regionale.

FEASR - Fondo Europeo Agricolo per lo Sviluppo Rurale.

FOSMIT - Fondo per lo sviluppo delle montagne italiane.

IBI - Indice di Biodiversità: Indicatore per misurare il benessere di un territorio oltre il PIL.

ICT - Information and Communications Technology

ICOMOS - International Council on Monuments and Sites: Organizzazione internazionale per la tutela dei beni culturali.

IGP - Indicazione Geografica Protetta: Certificazione europea per prodotti con legame geografico parziale.

ISTAT - Istituto Nazionale di Statistica: Ente italiano di statistica.

MISE - Ministero dello Sviluppo Economico: Ministero italiano che si occupava di politiche economiche (ora accorpato nel MIMIT).

MEF - Ministero dell'Economia e delle Finanze: Ministero italiano respon-

sabile delle politiche economiche e fiscali.

NGEU - Next Generation EU: Piano europeo per la ripresa economica post-COVID.

MIC - Ministero della Cultura: Ministero italiano responsabile del patrimonio culturale.

OECD - Organization for Economic Cooperation and Development.

PAC - Politica Agricola Comune: Politica europea per sostenere l'agricoltura.

PIL - Prodotto Interno Lordo: Indicatore economico per misurare la ricchezza prodotta in un territorio.

PNRR - Piano Nazionale di Ripresa e Resilienza.

PPP - Public-Private Partnership.

PSRN - Programma di Sviluppo Rurale Nazionale.

PSP - Piani Strategici di Sviluppo: Documenti di pianificazione per lo sviluppo territoriale.

RESR - Rete Europea per lo Sviluppo Rurale.

SDGs - Sustainable Development Goals: Obiettivi di sviluppo sostenibile delle Nazioni Unite.

SNAC - Strategia Nazionale di Adattamento ai Cambiamenti Climatici: Piano italiano per affrontare i cambiamenti climatici.

SNAI - Strategia Nazionale per le Aree Interne: Programma italiano per la rigenerazione delle aree interne.

SNAMI - Strategia Nazionale Montagna Italia: Programma di sviluppo specifico per i territori montani.

SPID - Sistema Pubblico di Identità Digitale: Sistema per l'accesso ai servizi online della Pubblica Amministrazione.

STCE - Protocollo addizionale alla Convenzione del Consiglio d'Europa.

SV - Smart Villages: Villaggi intelligenti, caratterizzati dall'integrazione di tecnologie innovative e strategie di sviluppo sostenibile.

VIA - Valutazione di Impatto Ambientale: Procedura per valutare l'impatto di opere sul territorio.

SDGs - Agenda 2030

Questa tesi si propone di promuovere i seguenti obiettivi fondamentali per il perseguimento di uno sviluppo sostenibile e in particolare:

7. Energia pulita e accessibile: Promuovere l'adozione di tecnologie innovative per la produzione e l'uso efficiente di energia rinnovabile, includendo il recupero del patrimonio costruito e l'implementazione di comunità energetiche;
8. Lavoro dignitoso e crescita economica: Favorire un'economia locale sostenibile che valorizzi le risorse endogene e il patrimonio culturale, creando opportunità lavorative stabili e inclusive;
9. Imprese, innovazione e infrastrutture: Incentivare lo sviluppo di infrastrutture resilienti e sostenibili, integrando innovazione tecnologica e materiali tradizionali;
10. Ridurre le disuguaglianze: Implementare strategie che garantiscano accesso equo a risorse, servizi e opportunità, riducendo il divario tra le aree rurali e urbane;
11. Città e comunità sostenibili: Creare strumenti e linee guida per il recupero intelligente del patrimonio urbano e rurale, orientati alla sostenibilità e al coinvolgimento comunitario;
12. Consumo e produzione responsabili: Promuovere il riutilizzo e il riciclo di materiali nel settore edilizio, sostenendo l'economia circolare e limitando l'impatto ambientale;
13. Lotta contro il cambiamento climatico: Integrare misure di mitigazione e adattamento al cambiamento climatico nelle politiche di gestione territoriale e di conservazione del patrimonio;
15. Vita sulla terra: Proteggere e valorizzare il paesaggio naturale e le biodiversità, promuovendo una gestione sostenibile delle risorse forestali e agricole;
17. Partnership per gli obiettivi: Costruire una rete collaborativa tra istituzioni, comunità e attori privati per promuovere strategie di sviluppo integrate e sostenibili, ispirate al modello di Smart Villages

Fig. 1 - SGDs per le aree rurali ©Luisa Lombardo, 2024

Abstract IT

La presente tesi dottorale, progetto finanziato dall'INPS – Istituto Nazionale di Previdenza Sociale - ha come obiettivi la valorizzazione e fruizione dei territori delle economie fragili e l'istituzione di buone pratiche nella gestione dei beni culturali. Il percorso di ricerca ha focalizzato lo studio sull'area del Parco delle Madonie, una delle aree SNAI italiane, situata nella Provincia di Palermo. L'obiettivo principale è stato quello di promuovere la transizione digitale e, allo stesso tempo, preservare la memoria storica dei luoghi con l'intento di promuovere lo sviluppo di *Smart Villages,* ovvero comunità rurali intelligenti.

L'obiettivo di questa ricerca è adottare un approccio intelligente che coniughi tradizione e innovazione, mantenendo la compatibilità con il patrimonio costruito e naturale. L'area delle Madonie rappresenta un'area protetta che possiede un patrimonio architettonico, naturalistico e faunistico di inestimabile valore. Comprendente 21 Comuni, la zona si estende nel cuore della Sicilia, abbracciando le Province di Palermo, Enna, Caltanissetta e Messina.

Nel corso della stesura di questa tesi, è stato tenuto in considerazione l'approccio metodologico adottato durante i tre anni di ricerca dottorale. Inizialmente, è stata condotta un'analisi dello stato dell'arte approfondita degli *Smart Villages* presenti nel panorama extraeuropeo ed europeo, con l'identificazione delle tematiche maggiormente implementate e delle strategie *smart* adottate. In particolare, è stata anche esaminata l'area della Comunità Valenciana, grazie al periodo di ricerca svolto all'estero presso la Real Academia de Bellas Artes de San Carlos de Valencia e l'Universitat Politècnica de València. Ulteriori approfondimenti riguardo ai casi di studio, soprattutto italiani, sono stati condotti tramite interviste a docenti, professionisti, cittadini e aziende che hanno lavorato o lavorano nelle aree interne, per comprendere il ventaglio degli approcci possibili intrapresi già negli ultimi anni. Al fine di applicare un approccio *smart* alla metodologia, è stata creata una rete di supporto alla ricerca, coinvolgendo *Partners, Cluster, Stakeholder* e facilitatori del comprensorio madonita nelle strategie da adottare. Riguardo all'area di riferimento, è stata eseguita una mappatura delle diverse tematiche intelligenti per identificare quali territori del comprensorio risultino attualmente più o meno *smart*.

La tesi propone la creazione di un Atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie in collaborazione con la Soprintendenza dei Beni Culturali e Ambientali della Provincia di Palermo, istituzione presso cui è stato svolto un tirocinio di un anno come da borsa assegnata. Lo strumento è volto alla collazione di tecnologie e strategie adottate in contesti ben conservati e tutelati per trasporle e proporle nel caso studio analizzato al fine di promuovere l'innovazione. Inoltre, vengono altresì elaborate delle Linee guida per il Centro Storico di Polizzi Generosa, un caso pilota scelto tra i 21 comuni dell'area delle Madonie, con l'intento di promuovere un recupero intelligente del patrimonio edilizio esistente, nel rispetto della tradizione costruttiva locale e dell'architettura di base. Infine, nel terzo capitolo, si intende formulare un possibile assetto organizzativo degli *Smart Villages* promuovendo linee guida, *Best Practices, Business Plan* e protocolli di gestione per formulare un nuovo sistema di sviluppo territoriale nelle aree interne in linea con gli obiettivi per lo sviluppo sostenibile promossi dall'Agenda 2030.

Abstract EN

This doctoral thesis, a project funded by INPS – the Italian National Institute of Social Security – aims to enhance and promote the use of territories characterized by fragile economies and to establish best practices in the management of cultural heritage. The research focuses on the area of the Madonie Park, one of the Italian SNAI (National Strategy for Inner Areas) territories, located in the Province of Palermo. The primary objective is to promote digital transition while simultaneously preserving the historical memory of the sites, with the ultimate aim of fostering the development of Smart Villages, or intelligent rural communities.

The purpose of this research is to adopt an intelligent approach that combines tradition and innovation, maintaining compatibility with both built and natural heritage. The Madonie area is a protected region with an invaluable architectural, naturalistic, and wildlife heritage. Comprising 21 municipalities, the territory extends into the heart of Sicily, encompassing the Provinces of Palermo, Enna, Caltanissetta, and Messina. During the development of this thesis, the methodological approach adopted throughout the three years of doctoral research was carefully considered. Initially, an in-depth analysis of the state of the art regarding Smart Villages in both extra-European and European contexts was conducted, identifying the most widely implemented themes and the smart strategies adopted. Notably, the Valencian Community was also examined thanks to the research period carried out abroad at the Real Academia de Bellas Artes de San Carlos de Valencia and the Universitat Politècnica de València. Further investigations into case studies, particularly Italian ones, were conducted through interviews with academics, professionals, citizens, and companies working or having worked in inner areas to understand the range of approaches undertaken in recent years. To apply a smart approach to the methodology, a research support network was established, involving partners, clusters, stakeholders, and facilitators from the Madonie territory to define the strategies to be adopted. Regarding the area under consideration, a mapping of the various smart themes was performed to identify which territories in the district are currently more or less aligned with smart principles.

The thesis proposes the creation of an Atlas of Technological Solutions for the recovery and enhancement of the inner areas of the Madonie Park in collaboration with the Soprintendenza dei Beni Culturali e Ambientali of the Province of Palermo, where a one-year internship was completed under the scholarship program. This tool is intended to compile technologies and strategies adopted in well-preserved and protected contexts and to transpose and propose them in the analyzed case study to foster innovation. Additionally, the thesis includes the development of Guidelines for the Historic Center of Polizzi Generosa, a pilot case chosen among the 21 municipalities of the Madonie area, aimed at promoting intelligent recovery of the existing building heritage while respecting local construction traditions and fundamental architecture.

Finally, in the third chapter, the thesis aims to propose a possible organizational structure for Smart Villages by promoting guidelines, best practices, business plans, and management protocols to develop a new territorial development system for inner areas aligned with the Sustainable Development Goals promoted by the 2030 Agenda.

Abstract ES

Esta tesis doctoral, un proyecto financiado por el INPS – Instituto Nacional de Previsión Social de Italia – tiene como objetivos la valorización y el uso sostenible de los territorios caracterizados por economías frágiles y el establecimiento de buenas prácticas en la gestión del patrimonio cultural. La investigación se centra en el área del Parque de las Madonías, una de las áreas SNAI (Estrategia Nacional para Áreas Internas) italianas, situada en la provincia de Palermo. El objetivo principal es promover la transición digital mientras se preserva la memoria histórica de los lugares, con el propósito de fomentar el desarrollo de Smart Villages, o comunidades rurales inteligentes.

El propósito de esta investigación es adoptar un enfoque inteligente que combine tradición e innovación, manteniendo la compatibilidad con el patrimonio construido y natural. El área de las Madonías es una región protegida que posee un patrimonio arquitectónico, natural y faunístico de valor incalculable. Compuesta por 21 municipios, el territorio se extiende en el corazón de Sicilia, abarcando las provincias de Palermo, Enna, Caltanissetta y Messina. Durante la elaboración de esta tesis, se consideró cuidadosamente el enfoque metodológico adoptado durante los tres años de investigación doctoral. Inicialmente, se realizó un análisis detallado del estado del arte sobre los Smart Villages presentes en contextos extraeuropeos y europeos, identificando las temáticas más implementadas y las estrategias inteligentes adoptadas. En particular, se examinó también la Comunidad Valenciana gracias al período de investigación realizado en el extranjero en la Real Academia de Bellas Artes de San Carlos de Valencia y la Universitat Politècnica de València. Además, se llevaron a cabo investigaciones sobre casos de estudio, especialmente italianos, mediante entrevistas con académicos, profesionales, ciudadanos y empresas que trabajan o han trabajado en áreas internas, para comprender el abanico de enfoques adoptados en los últimos años. Con el fin de aplicar un enfoque inteligente a la metodología, se creó una red de apoyo a la investigación, involucrando socios, clústeres, partes interesadas y facilitadores del territorio madonita en las estrategias a adoptar. Con respecto al área de referencia, se llevó a cabo un mapeo de las diferentes temáticas inteligentes para identificar qué territorios del distrito son actualmente más o menos alineados con los principios inteligentes.

La tesis propone la creación de un Atlas de Soluciones Tecnológicas para la recuperación y valorización de las áreas internas del Parque de las Madonías, en colaboración con la Soprintendenza dei Beni Culturali e Ambientali de la provincia de Palermo, institución en la cual se completó una pasantía de un año como parte del programa de becas asignado. Esta herramienta tiene como objetivo recopilar tecnologías y estrategias adoptadas en contextos bien conservados y protegidos, para transponerlas y proponerlas en el caso de estudio analizado, promoviendo así la innovación. Además, se desarrollan Lineamientos para el Centro Histórico de Polizzi Generosa, un caso piloto elegido entre los 21 municipios del área de las Madonías, con el objetivo de promover una recuperación inteligente del patrimonio edilicio existente, respetando la tradición constructiva local y la arquitectura fundamental.

Finalmente, en el tercer capítulo, se pretende proponer una posible estructura organizativa para los Smart Villages, promoviendo lineamientos, buenas prácticas, planes de negocio y protocolos de gestión para desarrollar un nuevo sistema de desarrollo territorial en las áreas internas, alineado con los Objetivos de Desarrollo Sostenible promovidos por la Agenda 2030.

Video di presentazione
del Progetto di Ricerca

CENTRI MINORI INTELLIGENTI NEL PARCO DELLE MADONIE IN SICILIA

STRATEGIE DI RECUPERO E VALORIZZAZIONE DELLE AREE INTERNE

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Fig. 1 | Geopark UNESCO delle Madonie © Carmelo Di Salvo, 2022

1. Articolazione e contenuto della tesi

Il presente lavoro di tesi mira ad esplorare la fattibilità e l'attuabilità della rinascita nelle aree interne italiane, con particolare attenzione al panorama siciliano, concentrandosi sui ventuno piccoli comuni delle Madonie e sulle loro vivaci comunità. L'analisi costituisce uno strumento propedeutico all'innovazione e alle opportunità, concentrando gli sforzi sulla delicata arte di ridare vita agli angoli remoti italiani e siciliani, preservando l'essenza e l'autenticità dei territori promuovendo il ripopolamento.

Il principale obiettivo di questa ricerca è sfidare l'inerzia economica e sociale che affligge le aree interne, proponendo con entusiasmo l'adozione di *Smart Villages*, una prospettiva moderna di villaggi radicata nella tecnologia e nell'intelligenza nell'applicazione di soluzioni innovative, coniugando tradizione e innovazione. Tale approccio offre un ventaglio di opportunità per promuovere lo sviluppo economico e sociale in zone dove le fragili economie sembrano prevalere.

Attraverso uno studio approfondito del Parco delle Madonie, Geopark UNESCO dal 2015, questa tesi si propone di esplorare e delineare nuovi percorsi per il progresso. Quest'enclave con la sua bellezza naturalistica e il suo fascino architettonico, altro non è che un laboratorio ideale per sperimentare come l'innovazione possa integrarsi armoniosamente con la tradizione e come la tecnologia possa coesistere con l'identità culturale radicata. I ventuno comuni, ognuno con la propria storia e carattere distintivo, costituiscono un terreno fertile per comprendere le sfumature e le complessità di questa evoluzione.

Questa tesi dottorale si propone di sfidare la staticità e l'inerzia di luoghi in cui il progresso potrebbe apparire un obiettivo insormontabile, invitando all'audacia e all'ingegnosità per creare una sinergia in grado di revitalizzare comunità a rischio di oblio. Si tratta di un'indagine volta a promuovere non solo lo sviluppo economico, ma anche la conservazione delle radici culturali, delle peculiarità architettoniche e della tessitura sociale che rendono uniche queste terre. L'approccio si immerge nelle strade meno battute, abbracciando lo spirito dell'innovazione e offrendo una visione di come gli *Smart Villages* possano rappresentare la chiave per sbloccare il potenziale nelle aree rurali a partire dal patrimonio costruito. Affronta il tema della costituzione degli *Smart Villages* nel Parco delle Madonie, in Sicilia, attraverso un volume articolato in tre parti principali e degli approfondimenti in Appendice contenenti i progetti che costituiscono parte del *corpus* della ricerca.

Di seguito si descrive l'articolazione della ricerca attraverso le sue parti principali:

- **Capitolo I – Lo sviluppo delle aree interne attraverso la costituzione di Smart Villages, un progetto condiviso**

Il primo capitolo della tesi esplora la vasta gamma di approcci, strategie e normative legate allo sviluppo degli *Smart Villages*. Il suo primo approccio pone l'accento su un'analisi approfondita della letteratura scientifica relativa agli *Smart Villages*, esaminando i principali temi e approcci emersi nella ricerca accademica sino ai giorni nostri. Segue uno studio comparativo degli *Smart Villages* a livello globale, con particolare attenzione a quelli extraeuropei ed europei. La prima fase dell'indagine ha comportato lo studio delle strategie e normative che regolano le zone rurali a livello globale, europeo e italiano. Questo approfondimento comprenderà anche un'indagine sulle normative di riferimento soprattutto a livello europeo e italiano, includendo la Convenzione di Faro, la Conferenza di Cork 2.0, il Piano d'azione dell'UE per i Villaggi Intelligenti e altri strumenti chiave che oggi hanno contribuito ad una prima ventata di novità, tuttavia ancora non sufficiente. Si è prestata particolare attenzione all'esame di casi studio di successo al fine di arricchire la comprensione delle sfide affrontate da altre comunità rurali e comprendere le prime soluzioni prese in considerazione e avviate. Questo processo ha incluso una valutazione approfondita delle strategie, tecnologie e innovazioni che hanno catalizzato la rivitalizzazione dei territori, costruen-

do una base di conoscenza robusta per sviluppare raccomandazioni e possibilità da traslare al contesto siciliano. Il capitolo proseguirà poi con un focus sulla tutela dei centri storici, analizzando la Dichiarazione di Davos 2018, le direttive ICOMOS su città e villaggi storici e la Legge "Salva Borghi" e tante altre emerse negli ultimi mesi anche prossime alla chiusura della tesi. L'obiettivo è fornire un quadro completo delle basi normative e delle linee guida già avanzate che possono determinare la creazione e la gestione degli *Smart Villages*.

- **Capitolo II – Le aree interne in Sicilia e il Comprensorio madonita. Verso la costituzione di una rete di Smart Villages**

Il secondo capitolo si concentra sulle peculiarità delle aree interne siciliane, con un focus specifico sul Comprensorio madonita e i suoi 21 centri minori. Dopo un'analisi del contesto territoriale e delle identità locali, si procederà alla schedatura dettagliata delle caratteristiche di ciascun centro, differenziando il territorio tra Alte Madonie, Basse Madonie e Madonie Imeresi. Successivamente un'analisi SWOT consentirà di valutare le potenzialità e le criticità delle aree interne e dei centri minori delle Madonie. In analisi sono state aggiunte anche delle aree gravitazionali, poichè considerate essenziali per lo sviluppo complessivo dell'area. Il Comune di Polizzi Generosa sarà poi esaminato come caso studio di riferimento, offrendo un'analisi dettagliata della sua storia, delle peculiarità, delle sfide e delle opportunità. Saranno illustrati i risultati dell'esperienza di Ricerca presso la Soprintendenza BB.CC.AA. della Provincia di Palermo nonchè le prospettive acquisite durante la ricerca all'estero a Valencia, e i casi studio analoghi al caso di riferimento individuato e analizzato. Questo approccio costituirà elemento di confronto e dialogo tra le aree e la valutazione degli approcci da intraprendere. Inoltre, sarà presentato il primo strumento proposto, l'Atlante, come ventaglio di soluzioni tecnologiche applicabili in loco, ma anche diffuse in tutto il comprensorio.

- **Capitolo III – Strategie di recupero, salvaguardia e valorizzazione del territorio locale attraverso l'approccio *smart***

Il terzo capitolo affronterà le strategie di recupero e valorizzazione delle aree interne, enfatizzando l'approccio *smart.* Si propone l'elaborazione di un sistema di gestione e di componenti attive e passive in grado di costituire lo *Smart Village* e farlo funzionare armoniosamente. Il Capitolo III esplorerà le diverse dimensioni dell'innovazione, comprese le tecnologie, l'economia verde, l'innovazione sociale e l'accessibilità. In particolare, sarà proposto un secondo strumento e supporto dei comuni *smart*, come le Linee guida per Polizzi Generosa, un caso emblematico di conoscenza, dialogo e comprensione nonchè operabilità nel patrimonio architettonico locale. Si procederà con la definizione di linee guida basate su *best practices*, creando un *framework* per implementare con successo strategie *smart*. Infine, il capitolo si concluderà con la formulazione di protocolli di gestione e un business plan per garantire la sostenibilità a lungo termine degli *Smart Villages*.

- **Conclusioni e Sviluppi futuri**

Le conclusioni sintetizzeranno i risultati chiave emersi dalla ricerca, offrendo un quadro chiaro delle potenzialità e delle sfide degli *Smart Villages* nelle aree interne siciliane. Saranno proposti sviluppi futuri, stimolando la riflessione su come migliorare e implementare concretamente le strategie delineate nella tesi. Nel dettaglio, verranno proposte Linee Guida, *Best Practice*, *Business Plan* e Protocolli di Gestione per lo sviluppo del territorio in esame. La speranza è che questa ricerca possa fungere da guida pratica per ispirare e supportare lo sviluppo sostenibile degli *Smart Villages* nelle Madonie e oltre.

La ricerca si propone di raggiungere obiettivi ampi, in primis la promozione dell'architettura tradizionale, dell'artigianato, della produzione locale, della

tecnologia e della digitalizzazione per alimentare l'economia e rafforzare l'identità della comunità. Parallelamente, cerca di creare nuove opportunità di lavoro, contrastando l'emigrazione giovanile e posizionando la regione come faro per l'innovazione tecnologica e digitale.

L'accessibilità dei centri urbani è un *focus* importante poichè migliora la connessione tra questi centri vitali e le periferie per garantire uno sviluppo armonioso dei territori.

La ricerca si impegna a contrastare il declino demografico, attrarre giovani e nuove famiglie e nuovi residenti, promuovere una vita nelle aree interne e sostenere l'agenda di sostenibilità ambientale considerando la possibilità di integrare il principio di mutua collaborazione tra i luoghi. Si propone anche di colmare il divario tra regioni rurali e moderne *Smart Cities*, migliorando i servizi e creando una rete interconnessa di opportunità per un progresso equilibrato.

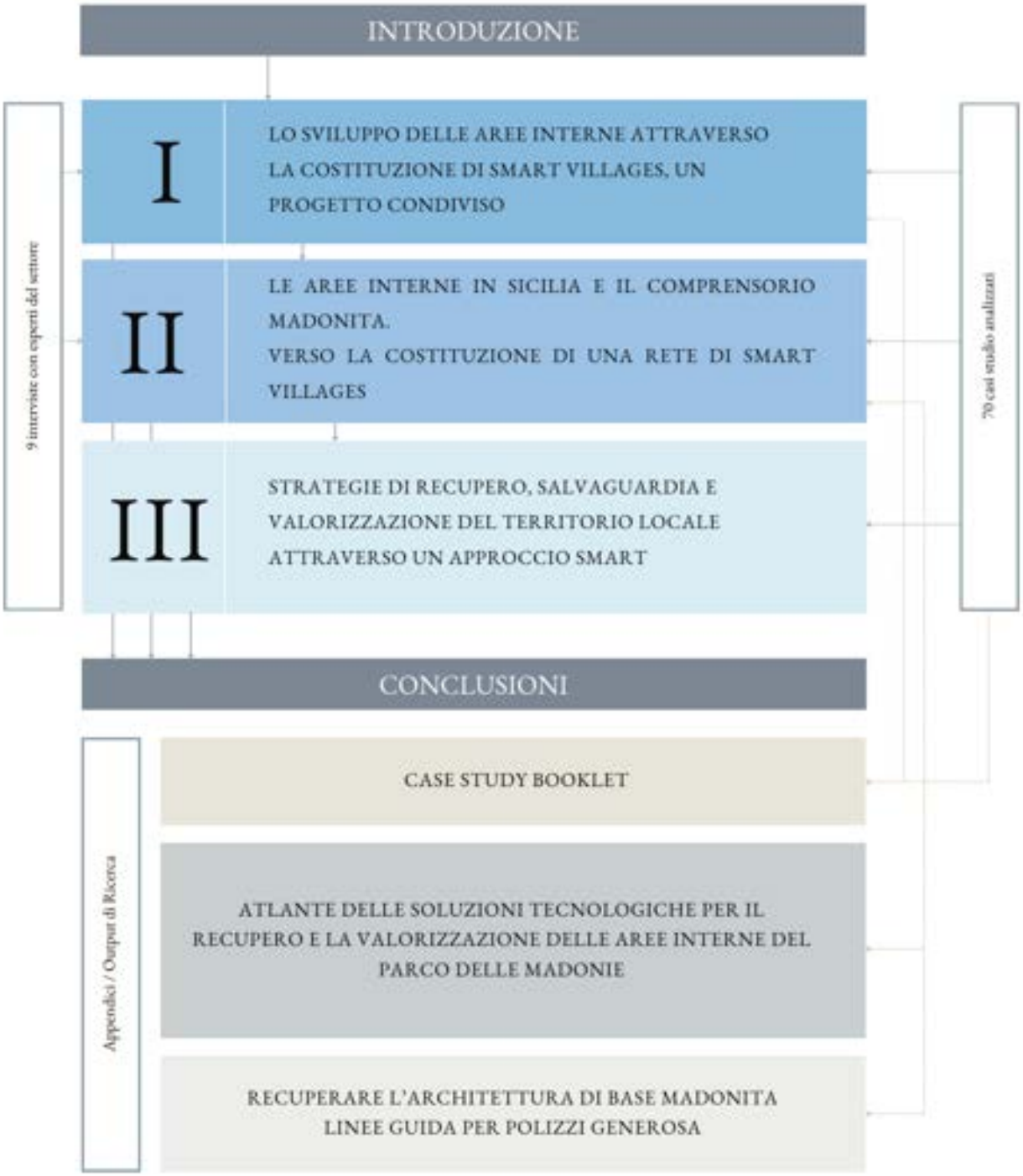

Fig. 2 | Schema di Ricerca ©Luisa Lombardo, 2024

L'indagine si è concentrata sull'esame delle tecnologie applicabili al patrimonio edilizio e delle strategie per il successo e l'innovazione delle aree in studio, considerando attentamente le risorse disponibili e le sfide locali, ma abbracciando, talvolta, soluzioni in via di sperimentazione per fornire un approccio oltre a ciò che è stato fatto nell'ottica di promuovere l'innovazione. Il periodo di tirocinio presso la Soprintendenza BB.CC.AA. della Provincia di Palermo ha arricchito la comprensione delle dinamiche territoriali, consentendo un contatto diretto con gli enti di tutela, le comunità locali, le amministrazioni e le associazioni. L'esperienza si è estesa anche al contesto spagnolo, presso la Real Academia des Bellas Artes de San Carlos e l'Universitat Politècnica de Valencia (UPV), fornendo prospettive innovative e replicabili.

Le esperienze sul campo acquisite durante le fasi di ricerca e tirocinio hanno conferito una prospettiva pragmatica al lavoro, consentendo di adattare le strategie in modo autentico. Come risultato, la tesi propone la creazione di un Atlante di soluzioni tecnologiche per gli *Smart Villages* nelle Madonie, unitamente a linee guida specifiche per il recupero e la valorizzazione del piccolo comune di Polizzi Generosa, caso pilota. Un manuale di recupero, chiamato Linee Guida, con un approccio all'avanguardia e pragmatico per la rinascita delle regioni montane siciliane, offrendo un supporto prezioso per implementare strategie di sviluppo sostenibile e innovative *in primis*, considerando il patrimonio edilizio come chiave per avviare processi di riqualificazione e rinnovamento dei piccoli comuni.

Il percorso intrapreso comprende lo studio di casi reali, l'analisi dettagliata di tecnologie e strategie efficaci, e l'acquisizione di esperienze dirette sul campo. L'obiettivo è fornire raccomandazioni tangibili, presentando una visione chiara per la creazione di *Smart Villages* come catalizzatori di cambiamento. Il confronto con casi reali rafforza la credibilità del progetto, potenziando la sua spinta verso uno sviluppo concreto delle aree interne. La speranza è che questa ricerca possa ispirare centri minori, amministrazioni locali, cittadini, imprese e istituzioni, contribuendo al progresso delle comunità rurali in Sicilia e in Italia, per analogia o contrasto, nel loro complesso.

2. Attualità e criticità del tema

L'attualità del tema affrontato in questo lavoro di tesi è di grande rilevanza in quanto i piccoli centri costituiscono l'86% delle aree urbane italiane e il 60% delle aree rurali dello stivale italiano. Questa ricerca affronta le sfide dei territori interni, rappresentando il 53% dei comuni italiani, concentrandosi su un approccio sistemico che supera i confini amministrativi della Strategia Nazionale Aree Interne (SNAI) e i fondi messi a disposizione dal Piano Nazionale di Ripresa e Resilienza (PNRR).

Situati prevalentemente nello spazio appenninico italiano, i territori interni rappresentano un campo di studio nuovo con sfide come il deterioramento del patrimonio abitativo e il declino economico e sociale. La ricerca si concentra sulla visione di recupero dei territori interni, esaminando centri minori coinvolti in iniziative internazionali. Il patrimonio presente in queste aree rappresenta un valore cruciale per l'interpretazione e lo sviluppo locale, suggerendo un approccio innovativo alla costituzione di piccoli villaggi. La persistente inerzia economica e sociale che caratterizza queste aree ha portato a una crescente marginalizzazione e a un rischio concreto di declino demografico; contestualmente, è emerso grande interesse negli ultimi anni al fine di riportalrle in auge, ripopolarle e rivitalizzarle. In un ambito in cui le fragili economie delle aree interne sembrano aver perso il sopravvento, l'approccio proposto di promuovere *Smart Villages* affiora come una prospettiva moderna e innovativa. Il "ritorno" ai territori interni emerge come elemento cruciale per la rinascita, favorendo la riconnessione tra dimensione imprenditoriale istituzione e cittadini. L'uso sapiente della tecnologia e delle soluzioni intelligenti potrebbe rappresentare un baluardo contro il declino, offrendo una nuova direzione per lo sviluppo economico e sociale. La tesi si propone di sfidare questa staticità, invitando a un cambiamento audace e

ingegnoso che possa rivitalizzare le comunità a rischio di oblio.

L'analisi dettagliata dell'area oggetto di studio, il Parco delle Madonie, con i suoi ventuno comuni distintivi, aggiunge concretezza al discorso, offrendo un laboratorio ideale per sperimentare l'integrazione armoniosa tra innovazione e tradizione. La ricerca non solo suggerisce l'adozione di soluzioni tecnologiche, ma mira anche a preservare l'identità culturale radicata in queste terre, contribuendo così a conservare le radici storiche e architettoniche che le rendono uniche. Il dibattito recente sulla possibilità di un "ritorno" alle aree interne, in risposta alla pandemia, ha evidenziato l'interesse crescente per questo tema. La ricerca sostiene la necessità di politiche territoriali mirate, come evidenziato anche nel "Piano Nazionale di Ripresa e Resilienza," per promuovere lo sviluppo sostenibile delle aree interne. Le strategie proposte, dalla promozione di caratteri identitari locali all'incremento dell'accessibilità dei centri urbani, si rivelano cruciali nel contrastare l'emigrazione giovanile e nel creare nuove opportunità di lavoro. Inoltre, la messa in primo piano dell'agenda di sostenibilità ambientale sottolinea l'importanza di un approccio olistico che valorizzi le risorse naturali e promuova uno sviluppo equilibrato.

L'analisi dettagliata delle Madonie in Sicilia offre un approccio operativo, proponendo possibili linee guida per il futuro. La ricerca suggerisce soluzioni tecnologiche e strategie per preservare l'identità culturale applicate al patrimonio costruito, contrastare l'emigrazione giovanile e promuovere lo sviluppo economico e sociale. Il confronto con casi studio di successo nel mondo arricchisce la comprensione delle sfide e delle opportunità. L'Atlante di soluzioni tecnologiche e le Linee guida specifiche per il recupero di Polizzi Generosa offrono strumenti pratici per implementare strategie di sviluppo sostenibile. La tesi si presenta come una risposta alle sfide attuali, offrendo una visione chiara per la creazione di *Smart Villages* come catalizzatori di cambiamento, sperando di ispirare comunità, istituzioni e imprese nel promuovere il progresso delle regioni interne.

La speranza è che questa ricerca possa ispirare non solo le comunità rurali italiane, ma anche le istituzioni, le imprese e tutti coloro che sono coinvolti nel promuovere il progresso delle regioni interne, contribuendo a un nuovo capitolo di crescita e prosperità in un contesto di mutua collaborazione.

3. Domande della Ricerca

Alla luce dell'identificazione del tema e della sua crescente centralità negli ultimi anni, la ricerca ha formulato alcune domande che hanno plasmato il campo di indagine, fornendo una base per la definizione di una traccia su cui costruire un secondo livello di interrogativi, al fine di delineare l'ambito di studio e le sue fasi.

Di seguito, vengono enunciate le domande che meglio esplicitano le problematiche emerse:

1. Considerando che lo sviluppo delle aree interne è un tema ampiamente discusso nella comunità scientifica e rappresenta un nodo centrale per l'interdisciplinarietà, come affrontare e reinterpretare il tema dello sviluppo dei centri minori?
2. È possibile individuare le principali criticità che oggi interessano i centri minori al fine di interpretare fenomeni diffusi come lo spopolamento, la desertificazionedei servizi e l'abbandono? Inoltre, è possibile riconoscere che i centri minori sono contemporaneamente riserve ricche di valore?
3. Spesso i piccoli centri minori sono considerati elementi secondari, denominati "borghi" in modo suggestivo. È quindi possibile considerarli come componenti fondamentali della rete della vita sociale, culturale ed economica del Paese?
4. Come le politiche territoriali degli ultimi anni hanno considerato i centri minori? È possibile delineare un progetto per questi territori e, partendo da ciò, immaginare future linee di azione che traggano vantaggio dalle esperienze pregresse?

5. Diverse esperienze di rigenerazione urbana stanno interessando i cenri minori del Paese. Come analizzare e interpretare questi fenomeni, facendo tesoro di tali esperienze?
6. In che modo, soprattutto negli ultimi anni, amministrazioni, progettisti e attori locali si sono approcciati alla questione? È possibile riconoscere un modello processuale negli interventi di rinascita dei centri minori? Come si sono evolute le pratiche sociali, culturali ed economiche (anche non convenzionali)?
7. È possibile ipotizzare un modello interpretativo utile a delineare le vocazioni territoriali al fine di immaginare azioni modellate sui luoghi e sulle peculiarità specifiche?

La ricerca si propone di rispondere a queste domande, concentrandosi principalmente sui territori interni e i piccoli centri del sud Italia, con particolare attenzione all'area del Parco delle Madonie come caso studio da indagare.

Come interrogativo finale, si pone la seguente domanda di sintesi:

Quale approccio operativo può delinearsi per ricomporre i divari di tipo sociale, economico e culturale tra i territori interni e il resto del Paese? In che modo il recupero dell'architettura esistente, e dunque il ruolo dell'architettura tecnica, può generare un cambiamento radicale nei territori?

4. Obiettivi della Ricerca

Per rispondere alle precedenti questioni, la presente ricerca si è prefissata di delineare obiettivi utili alla costruzione di un iniziale modello operativo, contribuendo al tema della rigenerazione e valorizzazione dei territori interni e dei piccoli centri. Ciò è stato effettuato mediante l'ipotesi di soluzioni capaci di affrontare e mitigare le criticità esistenti, quali il calo demografico, l'abbandono, il degrado fisico e sociale, nonché la dismissione del patrimonio, attraverso l'elaborazione di linee guida finalizzate a orientare amministrazioni, comunità, imprese e attori locali nella valorizzazione e promozione delle identità locali. Tali strategie mirano a ottimizzare i costi e i servizi, nonchè il lavoro non solo monetari, a vantaggio delle comunità.

Le strategie individuate si basano su soluzioni in grado di attivare politiche di ripopolamento sostenibile dei territori interni, introducendo nuove funzioni vitali per i centri urbani, al fine di attrarre le nuove generazioni e favorire la convivenza tra vecchi e nuovi abitanti. Questo processo è concepito come la costruzione di una società intermedia capace di sfruttare le opportunità presenti nelle promesse della *Smart Land* e di tradurle in pratiche economiche, sociali e culturali adatte a gestire i flussi.

Poste queste premesse, l'obiettivo primario della ricerca consiste nell'analisi dell'area del Parco delle Madonie in Sicilia, composta da 21 comunità e/o centri minori. Nonostante le considerevoli potenzialità di questa regione, si evidenzia un deficit di autonomia e l'assenza di un sistema di connettività avanzato, necessario per valorizzare adeguatamente le risorse endemiche sotto il profilo architettonico, sociale, enogastronomico e culturale.

Gli obiettivi specifici intrapresi dalla ricerca includono: identificare delle politiche *smart* da sottoporre alle amministrazioni per trovare una linea unitaria e comunitaria; conoscere, attraverso analisi SWOT, i punti di criticità e i punti di forza dell'area e, più specificatamente, dei centri minori appartenenti; promuovere e raggiungere gli obiettivi dello sviluppo sostenibile; facilitare l'innovazione attraverso lo sviluppo tecnologico del patrimonio costruttivo esistente e l'accessibilità a luoghi e siti; rendere le aree rurali dinamiche e aumentarne la competitività; sostenere il ricambio generazionale e favorire il ripopolamento; avviare uno scambio transnazionale in ambito europeo; avviare politiche di interscambio e di apprendimento reciproco tra i centri minori per esplicitare al meglio la loro qualifica di *Smart Villages*; aumentare la consapevolezza per una politica *smart*; creare una rete di *Smart Villages* nel Parco delle Madonie, coinvolgendo anche portatori di interesse esterni; creare linee guida utili alla riproposizione di intervento volti alla rigenerazione architettonico/paesaggistica, tecnologica e sociale.

Oltre a questo:

1. esplicitare il concetto di sviluppo locale, con particolare attenzione agli approcci differenziati in relazione ai territori interni, attraverso uno studio che evidenzi le principali peculiarità di ciascun approccio;
2. costruire un quadro delle principali questioni che interessano i territori interni e i piccoli centri, delineandone valori e criticità;
3. leggere e interpretare le opportunità derivanti dalle politiche di sviluppo locale degli ultimi anni, con un focus sulle "dimensioni del progetto" dei territori interni, cercando di armonizzare i diversi perimetri di azione;
4. ricercare e analizzare esperienze di recupero e valorizzazione dei piccoli centri, al fine di costruire un modello cognitivo e interpretativo che possa fungere da metrica per lo sviluppo di futuri approcci operativi;
5. applicare filtri di lettura rispetto alle fragilità e ai valori, costruendo un modello interpretativo del capitale territoriale e applicandolo al contesto marginale delle Madonie in Sicilia;
6. costruire un modello operativo che delinei possibili azioni future per affrontare le disparità nei territori interni, garantendo un approccio strategico e un sistema di coordinamento tra i diversi livelli di politiche e azioni già attive.

Inoltre, la ricerca mira a ottenere possibili ricadute:

- Sul piano disciplinare, proponendo una lettura critica e offrendo spunti di riflessione sul recupero e la valorizzazione dei territori interni e dei piccoli centri, nonché sullo sviluppo locale;
- sul governo del territorio, attraverso la proposta di atlanti e linee guida che rileggano i centri urbani come componenti attive del sistema territoriale, ripensando gli strumenti per una *governance* multilivello che guidi il coordinamento tra enti locali e territoriali;
- sulla rigenerazione urbana dei piccoli centri, offrendo linee guida atte a favorire il ripopolamento e la valorizzazione, con azioni generali da proporre, declinare e adattare ai contesti territoriali fragili.

La SNAI identifica i residenti dei centri minori come "custodi del territorio", attribuendo loro il compito di preservare e alimentare il senso identitario. La ricerca diventa così un'occasione per sensibilizzare le nuove generazioni, attivando la resilienza sociale nelle comunità dei piccoli centri. Basandosi sui principi di identità e resilienza, ma soprattutto recupero e valorizzazione, le azioni mirate alla formazione di reti collaborative di villaggi intelligenti o *Smart Villages* e sostenibili sono orientate a interagire con la vita reale delle comunità, implementando occasioni di sviluppo sostenibile. L'obiettivo finale della ricerca è individuare potenziali attori e futuri destinatari, instaurando una cooperazione basata sui risultati emersi, al fine di costruire possibili scenari futuri.

Il presente lavoro di tesi si propone di esplorare la fattibilità e l'attuabilità di un processo di rinascita, con un particolare focus sul paesaggio siciliano, concentrandosi sui ventuno piccoli comuni del Parco delle Madonie e sulle loro vibranti comunità. Il fulcro di questa ricerca è un'ode all'innovazione e all'opportunità, mirando a riportare in vita quegli angoli remoti d'Italia e della Sicilia che costituiscono l'essenza e l'autenticità della nostra Nazione. Per risvegliare comunità a rischio di oblio, per sfidare la staticità dei luoghi in cui il progresso sembra una sfida insormontabile, per promuove lo sviluppo economico e sociale, oltre a preservare radici culturali, peculiarità architettoniche e la tessitura sociale unica di queste terre, per promuovere i caratteri identitari locali. Si propone di valorizzare l'architettura, alimentando non solo l'economia ma anche l'identità della comunità, creando un distretto madonita che sia un faro per l'innovazione tecnologica e digitale.

Migliorare l'accessibilità, promuovere la digitalizzazione e contrastare il declino demografico sono aspetti chiave della proposta, così come migliorare la connessione tra i centri vitali e le periferie, invertendo la spirale del declino demografico e attirando giovani e nuove famiglie a tornare alle proprie radici, promuovendo una nuova vita nelle aree interne.

La ricerca promuove un'agenda di sostenibilità ambientale, valorizzando le risorse naturali e cercando di colmare il divario tra le regioni rurali e le moderne *Smart Cities*. L'obiettivo è migliorare i servizi e creare una rete interconnessa di opportunità per un progresso equilibrato.

L'analisi tecnologica e l'innovazione sociale sono parte integrante dell'indagine, con un *focus* su pilastri come l'infrastruttura digitale, l'ottimizzazione dell'uso dell'energia attraverso la costituzione di comunità energetiche, la promozione della mobilità sostenibile e l'innovazione sociale. Identificare soluzioni tecnologiche adatte alle esigenze peculiari delle comunità rurali siciliane.

Grazie al tirocinio presso la Soprintendenza BB.CC.AA. della Provincia di Palermo, la ricerca si arricchisce di una comprensione profonda delle dinamiche territoriali, contribuendo a linee guida e *best practices* per snellire i processi burocratici. L'esperienza di studio in Spagna fornisce una prospettiva internazionale, arricchendo gli strumenti a disposizione attraverso l'apprendimento dalle iniziative innovative e le strategie di rivitalizzazione di una città già nota per i suoi successi.

L'Output del progetto di ricerca è la creazione di un Atlante di soluzioni tecnologiche per gli *Smart Villages* nelle Madonie, insieme a Linee guida specifiche per il recupero e la valorizzazione del comune di Polizzi Generosa.

In definitiva, questa ricerca rappresenta un'odissea di opportunità, unendo tradizione e innovazione per alimentare la vitalità delle regioni rurali. L'obiettivo è trasmettere raccomandazioni tangibili, affinché gli *Smart Villages* immaginati per il Parco delle Madonie diventino catalizzatori di cambiamento, trasformando le economie fragili in comunità vigorose, capaci di adattarsi, condividere, promuovere condizioni di vita attuali e prosperare.

5. Metodologia e Strumenti della Ricerca

La metodologia adottata per la presente ricerca si configura come un approccio sistematico e multidisciplinare, mirato a esplorare e delineare soluzioni innovative per la rinascita delle aree interne italiane, con particolare attenzione al contesto siciliano, focalizzandosi sui ventuno piccoli comuni delle Madonie. Attraverso l'impiego di un approccio analitico preliminare e interpretativo successivo, la presente ricerca si propone di formulare buone pratiche e linee guida per i processi di rigenerazione e valorizzazione dei centri minori, utilizzando come caso studio il territorio siciliano dele Madonie. Gli approcci adottati durante il percorso di ricerca sono distinti come segue:

Approccio Analitico:

- definizione dell'ambito di indagine attraverso l'esplorazione critica degli approcci scientifici e della letteratura scientifica di riferimento;
- ricostruzione dello stato dell'arte e delle normative riguardo ai temi della rigenerazione e dello sviluppo locale nei territori interni;
- indagine sul caso applicativo delle Madonie.

Approccio Interpretativo e Costruzione del Metodo:

- lettura e interpretazione critica di casi sperimentali relativi a interventi di rinascita e valorizzazione dei piccoli centri;
- analisi degli approcci e dei principi alla base dei processi di rigenerazione;
- costruzione di un quadro conoscitivo/interpretativo del territorio delle Madonie mediante la redazione di un apparato che restituisca il quadro attuale e tendenziale con la selezione e l'interpretazione dei dati significativi per la redazione di possibili strategie di intervento.

Approccio Deduttivo e Propositivo:

- individuazione/deduzione del campo d'azione attraverso l'elaborazione di strumenti finalizzati alla riattivazione dei territori interni e alla rigenerazione dei piccoli centri.

La ricerca adotta una metodologia che si basa su approcci qualitativi e quantitativi, proponendone l'ibridazione e la compresenza. L'approccio qualitativo è considerato un processo dinamico, secondo il quale la ricerca non segue una sequenza di procedure predefinite, ma è piuttosto un'interazione confusa tra il mondo concettuale e quello empirico. Nel caso della ricerca quantitativa, il metodo è strutturato in fasi logiche sequenziali, con un'impostazione deduttiva in cui l'osservazione è preceduta dalla teoria, muovendosi nel contesto della giustificazione tramite i dati empirici. L'approccio metodologico per la costruzione dell'apparato bibliografico si basa sull'elaborazione di una bibliografia ragionata, individuando macro-temi che generano le parti principali della ricerca. Il percorso di ricerca segue una struttura dinamica e non lineare, evidenziando una lettura tra le dimensioni dei territori interni e dei piccoli centri, sia in modo esplicito che implicito nelle diverse sezioni della ricerca.

La prima fase dell'indagine ha consistito in un'analisi approfondita delle strategie e delle normative che regolano le zone rurali a livello extraeuropeo, europeo e italiano. Questo approccio ha permesso di comporre un quadro dettagliato delle dinamiche socioeconomiche e delle sfide specifiche che caratterizzano le aree interne. Parallelamente, si è condotta un'analisi attenta di casi studio internazionali di successo, focalizzandosi sugli *Smart Villages* che hanno prosperato in diverse parti del mondo. Questo studio comparativo ha offerto un'ampia prospettiva sulle strategie, tecnologie e innovazioni che hanno contribuito alla rivitalizzazione di comunità rurali, affrontando sfide analoghe a quelle riscontrate nelle Madonie.

Successivamente, un'analisi dettagliata si è concentrata sulle tecnologie in commercio e ancora in fase di sperimentazione e le strategie per potenziare le aree in esame. Dall'infrastruttura digitale all'ottimizzazione dell'uso dell'energia, dalla promozione della mobilità sostenibile alla gestione delle risorse naturali e all'innovazione sociale, dal recupero del patrimonio architettonico all'accessibilità, l'obiettivo è stato identificare soluzioni tecnologiche in sintonia con le esigenze locali e le sfide specifiche. Gli obiettivi chiave della ricerca sono stati plasmare un equilibrio armonioso tra tradizione e innovazione, sfidando l'inerzia economica e sociale delle aree interne. La promozione degli *Smart Villages* è stata adottata come strategia principale, incentrata sulla fusione tra tecnologia e caratteri identitari locali, contribuendo così allo sviluppo economico e sociale delle Madonie.

Le esperienze sul campo, inclusi il tirocinio presso la Soprintendenza BB.CC.AA. della Provincia di Palermo e lo studio in Spagna, hanno arricchito la ricerca con una prospettiva pratica. L'interazione diretta con le comunità locali e le istituzioni ha consentito di adattare le strategie in modo autentico, oltre a fornire linee guida e *best practices* per semplificare i processi burocratici. Il culmine del progetto di ricerca si traduce nella creazione di un Atlante di soluzioni tecnologiche e sostenibili specifiche per le Madonie, orientate alla costituzione di *Smart Villages*. In aggiunta, sono state formulate linee guida dettagliate per il recupero e la valorizzazione del comune di Polizzi Generosa, fungendo da caso pilota tra i 21 analizzati nel Parco delle Madonie. In sintesi, la metodologia adottata ha integrato una ricerca teorica approfondita con esperienze pratiche, mirando a offrire raccomandazioni tangibili e una visione chiara per la creazione di *Smart Villages* in grado di catalizzare il cambiamento, promuovendo la vitalità e la prosperità delle comunità rurali delle Madonie e, potenzialmente, di tutta Italia ed d'Europa nel mondo.

6. Stato dell'arte ed Elementi di originalità

Il contesto attuale della ricerca proposta si inserisce in un quadro di crescente riconoscimento dell'importanza delle aree interne italiane, specialmente considerando le dinamiche socio-economiche che le hanno caratterizzate recentemente. In questo momento, l'attenzione nei confronti di queste regioni è amplificata sia a livello nazionale che europeo, con particolare rilevanza all'interno dello SNAI (Strategia Nazionale Aree Interne) e del PNRR (Pia-

no Nazionale di Ripresa e Resilienza).

Nel panorama attuale, la discussione sull'innovazione e sull'opportunità nelle aree interne è in costante crescita. L'emergerne del concetto di *Smart Villages* o villaggi intelligenti assume particolare rilevanza, delineando una prospettiva e visione moderna che sottolinea l'importanza di integrare tecnologia e innovazione senza compromettere l'identità e la tradizione locale.

L'analisi delle strategie e delle normative a livello extraeuropeo, europeo e italiano evidenzia la complessità del quadro normativo e offre una base solida per comprendere le dinamiche che influenzano le aree rurali. La valutazione di casi studio di successo, sia a livello globale che in specifici contesti italiani ed europei, aggiunge un importante strato di conoscenza alla ricerca, fornendo spunti pratici e soluzioni già implementate in contesti simili.

Il Piano Nazionale di Ripresa e Resilienza, che si inserisce dopo la Strategia Nazionale Aree Interne, svolge un ruolo chiave nell'affrontare le sfide delle regioni interne italiane. Le politiche di sviluppo territoriale e l'allocazione di risorse finanziarie mirate rappresentano una risposta concreta alle esigenze di questi territori. La centralità assegnata alle aree interne nei documenti strategici nazionali testimonia il riconoscimento dell'importanza di investire in queste regioni per garantire uno sviluppo sostenibile e equilibrato su tutto il territorio nazionale. La promozione degli *Smart Villages* è in sintonia con gli obiettivi dichiarati dal PNRR, che mira a stimolare lo sviluppo economico, la sostenibilità ambientale e l'inclusione sociale. In questo contesto, l'approccio della ricerca, che enfatizza la valorizzazione dell'identità locale attraverso l'innovazione, è in linea con le direttrici delineate dai programmi di governo.

La peculiarità di questa ricerca risiede nella sua focalizzazione sulle Madonie, un contesto particolare che funge da microcosmo per esplorare la connessione tra innovazione e tradizione. La sfida della staticità delle aree rurali è affrontata in modo audace, incoraggiando un dialogo tra passato e futuro, tradizione e tecnologia. L'approccio multidisciplinare, che abbraccia aspetti culturali, sociali ed economici, è un elemento distintivo che arricchisce il panorama delle ricerche in questo settore.

L'analisi dettagliata delle tecnologie e delle strategie specifiche sparse nel mondo applicabili alle Madonie, unita alle esperienze sul campo e ai tirocini presso istituzioni chiave, conferisce alla ricerca una dimensione pratica e pragmatica. La creazione di un Atlante di soluzioni tecnologiche compatibili e sostenibili, insieme alle Linee guida per il recupero di Polizzi Generosa, rappresenta un contributo tangibile per le amministrazioni locali, cittadini, imprese e associazioni nell'implementazione di strategie di sviluppo sostenibile. Questa ricerca si posiziona in modo rilevante nel contesto delle attuali dinamiche nazionali ed europee, contribuendo con originalità e pragmatismo alla discussione sul futuro delle aree interne italiane, promuovendo la creazione di reti e di villaggi intelligenti in grado di rivitalizzare e valorizzare le comunità locali.

7. Destinatari della Ricerca

La ricerca dottorale si rivolge a diversi destinatari al fine di massimizzare la sua portata e impatto. I principali destinatari sono:

- **Accademie e Istituzioni di Ricerca:** La ricerca dottorale mira a contribuire al dibattito accademico e scientifico nelle discipline legate alla rigenerazione territoriale, allo sviluppo locale e alla valorizzazione dei piccoli centri. Le università, istituti di ricerca e accademici sono chiamati a valutare e incorporare le nuove prospettive, metodologie e approcci proposti nella ricerca promuovendo la terza Missione;
- **Amministrazioni Pubbliche:** Gli enti locali, regionali e nazionali, nonché le autorità pubbliche, rappresentano un importante pubblico destinatario. Le linee guida proposte dalla ricerca possono essere utilizzate per orientare le politiche pubbliche e contribuire alla formulazione di strategie mirate per la rigenerazione dei territori interni e dei piccoli centri;

- **Comunità Locali:** Le comunità locali, in particolare quelle dei territori interni e dei piccoli centri, sono destinatari fondamentali. La ricerca punta a sensibilizzare e coinvolgere attivamente le comunità nel processo di rigenerazione, promuovendo la partecipazione e la collaborazione per un approccio inclusivo e sostenibile;
- **Stakeholder e Attori del Territorio:** Aziende locali, organizzazioni non governative, associazioni culturali e altri attori del territorio sono chiamati a considerare e implementare le strategie proposte dalla ricerca. La cooperazione con tali *stakeholder* è fondamentale per la realizzazione pratica delle proposte avanzate;
- **Studiosi e Ricercatori:** La ricerca fornisce un contributo significativo alla formazione di nuovi ricercatori e studiosi interessati alle tematiche della rigenerazione territoriale e dello sviluppo locale. Questi possono trarre ispirazione dalla metodologia e dalle scoperte della ricerca per ulteriori indagini e approfondimenti;
- **Pubblico in Generale:** Infine, la ricerca ha l'obiettivo di informare il pubblico in generale, sensibilizzando su questioni cruciali legate alla rigenerazione territoriale, alla valorizzazione dei piccoli centri e allo sviluppo locale. Una comunicazione chiara e accessibile permette di coinvolgere un pubblico più ampio e di diffondere consapevolezza su tali tematiche.

8. Possibili sviluppi futuri

Guardando avanti, la ricerca intende esplorare ulteriori vie per lo sviluppo e l'implementazione degli *Smart Villages* nelle aree interne siciliane, con un *focus* particolare sul Comprensorio delle Madonie, ma anche sviluppare la stessa metodologia in altri contesti siciliani e non, per analogia o per contrasto. Uno dei possibili sviluppi futuri potrebbe riguardare l'approfondimento delle relazioni e delle sinergie tra i vari centri minori all'interno delle Madonie, con l'obiettivo di creare una rete interconnessa e collaborativa di *Smart Villages*. Questo potrebbe essere facilitato attraverso l'implementazione di progetti pilota che promuovono lo scambio di risorse, conoscenze, saperi e esperienze tra le comunità.

Coinvolgere attivamente e maggiormente la gioventù locale nei processi decisionali e nello sviluppo delle strategie per gli *Smart Villages*. Questo potrebbe essere realizzato attraverso programmi educativi e di formazione che incoraggiano l'imprenditorialità giovanile, l'innovazione e la partecipazione civica. Coinvolgere i giovani non solo garantirebbe una maggiore diversità di prospettive e idee, ma potrebbe anche contribuire a contrastare l'emigrazione giovanile e a mantenere vive le comunità rurali, dando respiro a comunità troppo radicate nel passato.

Esplorare l'implementazione di soluzioni tecnologiche avanzate, come l'intelligenza artificiale e l'*Internet of Things*, per migliorare l'efficienza dei servizi pubblici, l'uso delle risorse e la qualità della vita nelle aree rurali. Queste tecnologie potrebbero essere utilizzate per ottimizzare la gestione dei rifiuti, migliorare l'agricoltura sostenibile, garantire la sicurezza delle infrastrutture e promuovere il turismo responsabile.

Infine, potrebbe essere utile stabilire *partnership* e collaborazioni con enti pubblici, istituzioni accademiche, imprese private e organizzazioni non governative al fine di sostenere e finanziare l'implementazione degli *Smart Villages.* Questo potrebbe includere la ricerca di finanziamenti nazionali, europei e internazionali per progetti di sviluppo locale, nonché la creazione di reti di sostegno e scambio di conoscenze tra attori interessati.

Il futuro degli *Smart Villages* nelle Madonie e oltre dipenderà dalla capacità di adattare e implementare con successo le strategie delineate nella ricerca, nonché dalla volontà e dall'impegno delle comunità locali, delle istituzioni e dei vari attori interessati a lavorare insieme per il progresso e la sostenibilità delle aree rurali siciliane.

Fig. I | Un viale alberato porta al villaggio di Petralia Soprana © Nicola Pulham, 2018

Capitolo I

LO SVILUPPO DELLE AREE INTERNE ATTRAVERSO LA COSTITUZIONE DI SMART VILLAGES, UN PROGETTO CONDIVISO

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Capitolo I
Abstract

IT

Il presente capitolo fornisce un'analisi esaustiva degli *Smart Villages* a livello globale, europeo e nazionale, focalizzandosi sull'integrazione di strategie sostenibili e innovative per la promozione e lo sviluppo territoriale. Una particolare attenzione è dedicata all'implementazione della transizione digitale e a un approccio innovativo al territorio come motori principali per il progresso delle comunità rurali.

Nella prima sezione, vengono presentati casi studio extraeuropei, europei e italiani di villaggi intelligenti riscontrati nella letteratura scientifica e nelle fonti divulgative e generaliste che hanno adottato con successo strategie innovative. Questi casi rappresentano esempi concreti di come l'integrazione di soluzioni digitali e sostenibili abbia contribuito alla rinascita delle aree interne, fungendo da ispirazione per il contesto di studio specifico. La metodologia proposta mira all'estrapolazione di strategie vincenti da questi casi studio e alla loro adattabilità nell'area oggetto di ricerca.

Successivamente, al fine di ricondurre la ricaduta di queste nel caso studio scelto, e dunque, nel caso italiano lo studio analizza la normativa vigente, le strategie nazionali ed europee a supporto della rivitalizzazione dei villaggi intelligenti. Questa seconda sezione fornisce una comprensione approfondita delle dinamiche che possono essere intraprese, delineando i progetti, le iniziative chiave e i fondi per la rivitalizzazione dei centri minori. L'obiettivo è quello di fornire un quadro normativo e strategico che guidi lo sviluppo di politiche locali orientate al benessere delle comunità rurali, con un'enfasi particolare sulla sinergia tra innovazione tecnologica e sostenibilità ambientale, nonchè compatibilità tecnologica.

Il capitolo inaugura il percorso di studio delineando le esperienze internazionali e nazionali di successo, fungendo da fondamentale cornice concettuale per la definizione di strategie innovative e sostenibili destinate a plasmare il futuro delle comunità rurali villaggi intelligenti con una ricaduta sulle aree interne siciliane.

EN

This chapter provides a comprehensive analysis of Smart Villages at the global, European, and national levels, with a focus on the integration of sustainable and innovative strategies for territorial promotion and development. Particular attention is given to the implementation of digital transition and an innovative approach to territorial management as primary drivers for the progress of rural communities.

The first section presents case studies of Smart Villages from outside Europe, within Europe, and in Italy, identified through scientific literature and general sources. These villages have successfully adopted innovative strategies, offering concrete examples of how the integration of digital and sustainable solutions has contributed to the revitalization of inner areas. These cases serve as inspiration for the specific context under study. The proposed methodology aims to extract successful strategies from these case studies and assess their adaptability to the research area.

Subsequently, in order to apply these findings to the chosen case study—specifically within the Italian context—the research analyzes current legislation, as well as national and European strategies supporting the revitalization of Smart Villages. This second section provides a detailed understanding of the dynamics that can be undertaken, outlining key projects, initiatives, and funding opportunities for the revival of small centers. The aim is to offer a regulatory and strategic framework to guide the development of local policies focused on the well-being of rural communities, with particular emphasis on the synergy between technological innovation, environmental sustainability, and technological compatibility.

This chapter sets the foundation for the study by outlining successful international and national experiences, serving as a critical conceptual framework for defining innovative and sustainable strategies. These strategies are intended to shape the future of rural communities and Smart Villages, with specific impacts on Sicily's inner areas.

ES

Este capítulo ofrece un análisis exhaustivo de los Smart Villages a nivel global, europeo y nacional, centrándose en la integración de estrategias sostenibles e innovadoras para la promoción y el desarrollo territorial. Se presta especial atención a la implementación de la transición digital y a un enfoque innovador hacia la gestión del territorio como motores principales para el progreso de las comunidades rurales.

En la primera sección se presentan estudios de caso de Smart Villages en contextos extraeuropeos, europeos y en Italia, identificados en la literatura científica y en fuentes divulgativas generales. Estos casos han adoptado con éxito estrategias innovadoras, representando ejemplos concretos de cómo la integración de soluciones digitales y sostenibles ha contribuido a la revitalización de las áreas interiores. Estos casos sirven como fuente de inspiración para el contexto específico de estudio. La metodología propuesta busca extraer estrategias exitosas de estos casos y evaluar su adaptabilidad al área de investigación.

Posteriormente, con el objetivo de aplicar estos resultados al caso de estudio elegido—específicamente dentro del contexto italiano—la investigación analiza la normativa vigente, así como las estrategias nacionales y europeas de apoyo a la revitalización de los Smart Villages. Esta segunda sección ofrece una comprensión detallada de las dinámicas que pueden ser emprendidas, destacando proyectos clave, iniciativas y fondos destinados a la revitalización de los pequeños centros urbanos. El objetivo es proporcionar un marco normativo y estratégico que guíe el desarrollo de políticas locales orientadas al bienestar de las comunidades rurales, con un énfasis particular en la sinergia entre innovación tecnológica, sostenibilidad ambiental y compatibilidad tecnológica.

Este capítulo inaugura el recorrido del estudio al delinear experiencias internacionales y nacionales exitosas, sirviendo como un marco conceptual fundamental para la definición de estrategias innovadoras y sostenibles. Estas estrategias están destinadas a moldear el futuro de las comunidades rurales y los Smart Villages, con un impacto específico en las áreas interiores de Sicilia.

LO SVILUPPO DELLE AREE INTERNE ATTRAVERSO LA COSTITUZIONE DI SMART VILLAGES, UN PROGETTO CONDIVISO

Nell'era moderna, l'evoluzione tecnologica ha generato un profondo cambiamento nella concezione delle città, portando alla nascita delle *Smart Cities*, queste hanno sviluppato una maggiore intelligenza, trasformandosi per necessità di adattamento al presente. Sono state inizialmente pensate come centri urbani in cui le tecnologie dell'informazione e della comunicazione venivano integrate per migliorare la qualità della vita dei cittadini. Questo approccio ha portato all'ottimizzazione dei servizi pubblici, alla gestione efficiente delle risorse e all'incremento della sostenibilità ambientale. La *Smart City*, termine che ha guadagnato popolarità negli ultimi anni, si riferisce a città che utilizzano la tecnologia e l'innovazione per migliorare l'efficienza, la qualità dei servizi e la sostenibilità unitamente al concentrarsi di popolazione lì dove i servizi erano maggiori ed efficienti. Tuttavia, la rapida urbanizzazione e la concentrazione delle risorse nelle grandi città hanno anche evidenziato sfide significative, come l'inquinamento, il traffico congestionato e lo stress sociale[1]. Queste sfide hanno spinto ad ampliare la prospettiva, portando all'evoluzione concettuale dalla *Smart City*[2] alla *Smart Land* (Bonomi et al., 2014).

La transizione verso la *Smart Land* riflette una visione più ampia che considera non solo le città come epicentri dell'innovazione, ma anche le aree rurali come parte integrante di un ecosistema socio-tecnologico (Organization for Economic Cooperation and Development - OECD, 2016). Questo passaggio di prospettiva è guidato dall'obiettivo di creare equilibrio tra sviluppo urbano e rurale, abbracciando una serie di concetti chiave tra cui:

- **rigenerazione rurale:** promuove il recupero e la valorizzazione delle aree rurali, che, spesso, sono state trascurate a favore delle città. Attraverso investimenti in infrastrutture digitali, agricoltura intelligente e turismo sostenibile, le comunità rurali possono, infatti, rigenerarsi diventando centri di innovazione e sviluppo (Bonomi et al., 2014);

Fig. I.1 | Confronto aree urbane e rurali © Luisa Lombardo, 2023.

[1] "*Uno studio sistemico realizzato da progettisti e tecnici per le grandi città, capitali, città metropolitane e piccoli borghi nella pianificazione dei servizi di base, e-governance, uso del suolo, densità urbana, infrastrutture, viabilità e reti efficienti, usi urbani integrati, spazi pubblici, infrastrutture verdi, sistema dei servizi pubblici e molto altro ancora, diventa condizione necessaria ed indispensabile. La città intelligente ha quindi la finalità di creare una mappa compatta, connessa, socialmente inclusiva e resiliente, adatta alle esigenze di tutti. Una città che sfrutta il potere della tecnologia, dei dati e dell'innovazione per migliorare la qualità della vita e per coordinare e integrare i settori della gestione urbana da tempo bisognosi di innovazione. Dovremmo iniziare ad analizzare le singole città nella loro sostenibilità, quindi nelle "needs" che ci consentirebbero una programmazione e pianificazione intersettoriale gerarchica da sistemizzare per il raggiungimento dell'equilibrio fra popolazione e territorio, finalizzando al miglioramento delle condizioni. Oggi, nell'era digitale, dove i dati corrono alla velocità della luce, paradossalmente la vita ricomincia a scorrere più lentamente con un ritorno al passato proiettato nel futuro, dove il piaere di poter pranzare nella propria casa torna ad essere la normalità grazie ad una nuova modalità lavorativa chiamata "Home-based". La Smart City nella sua accezione terminologica, ovvero "Città Intelligente", il cui termine creato lascia una ampia definizione non definita del significato, dà spazio all'elaborazione di confini non definibili realmente perchè in definizione.*" Agrosi G. (a cura di) La *Smart City* e la città comoda. Una nuova realtà futurista "smartiana". Mimesis Edizioni, 2022

[2] è l'ideale collettivo della città del futuro. Un'area urbana in cui, grazie all'utilizzo delle tecnologie digitali e dell'innovazione tecnologica, è possibile ottimizzare e migliorare le infreastrutture e i servizi ai cittadini rendendoli più efficienti. *"La città intelligenre è l'insieme di strategie di pianificazione urbanistica volte all'ottimizzazione e all'innovazione dei servizi pubblici per mettere in relazione le infrastrutture delle città con il capitale umano, intellettuale e sociale di chi le abita attraverso l'uso delle nuove tecnologie"* LUMI4innovation. (2020). Smart city: Cos'è, come funziona, caratteristiche ed esempi in Italia. Retrieved December 16, 2024, from https://www.lumi4innovation.it/smart-city-cose-come-funziona-caratteristiche-ed-esempi-in-italia/

- **villaggi rurali intelligenti:** rappresentano un nuovo approccio all'abitare, in cui la tecnologia è utilizzata per migliorare la qualità della vita in contesti rurali. L'accesso a servizi digitali avanzati, sistemi di gestione energetica efficiente e soluzioni di mobilità sostenibile possono trasformare questi villaggi in comunità vivaci e resilienti (OECD, 2018);
- **connettività diffusa:** elemento fondamentale che riduce il divario digitale tra città e aree rurali. L'accesso a Internet ad alta velocità e la copertura mobile sono essenziali per garantire che le comunità rurali possano beneficiare appieno delle opportunità tecnologiche (UN-habitat, 2019);
- **sostenibilità integrata:** promuovendo pratiche di recupero agricole e industriali eco-compatibili e incoraggiando la conservazione dell'ambiente naturale e dell'architettura tradizionale. Questo crea un equilibrio tra crescita economica e preservazione dell'ambiente (World Economic Forum, 2018);
- **economia circolare:** i rifiuti prodotti vengono ridotti al minimo, riutilizzati e le risorse sono utilizzate in modo più efficiente, favorendo la creazione di comunità autosufficienti (Gonzalez-Alvarez et al, 2017) non solo per ciò che concerne il conferimento, ma anche il loro riutilizzo nella quotidianità, ad esempio, nel campo edile.

L'evoluzione dal concetto di *Smart City*[3] a quello di *Smart Land* rappresenta un passo avanti nella costruzione di un futuro sostenibile e inclusivo[4]. La promozione di villaggi rurali intelligenti e la valorizzazione delle aree rurali non solo bilanciano lo sviluppo urbano, ma abbracciano anche l'essenza stessa della connessione tra uomo e ambiente creando un equilibrio tra i vantaggi e svantaggi che li caratterizzano (*Fig. 2*). Questa transizione rappresenta una nuova frontiera dell'abitare, in cui tecnologia, sostenibilità e comunità convergono per creare un mondo più equilibrato e armonioso (Costa L.SC. et al, 2019).

La metamorfosi dalla *Smart City* alla *Smart Land*[4], proposta *in primis* dal Professore Roberto Masiero[5], nel già lontano 2014 (Bonomi et al., 2014) per il caso italiano, rappresenta un approccio innovativo e significativo nel contesto dello sviluppo territoriale e apre nuove opportunità per le piccole aree marginali del nostro Paese. Il concetto riflette un cambiamento di prospettiva, spostando l'attenzione non solo dalle città, ma anche verso le aree rurali e i territori meno densamente popolati come le periferie o i paesi dell'entroterra alpino e appenninico. Questa transizione, che tuttavia è diffusa in tutta Europa, mira a promuovere uno sviluppo armonico ed equilibrato, abbracciando l'intero paesaggio geografico e sociale, senza escluderne alcuno (Antonelli, 2019).

Fig. I.2 | Vantaggi e svantaggi aree urbane e rurali in Italia, © Luisa Lombardo, 2023.

[3] "*Ad oggi non esiste una definizione univoca di Smart City, infatti, le linee guida programmatiche delle condizioni generali della città intelligente trovano il loro denominatore comune in termini condivisibili a livello comunitario-planetario che si personalizzazione nella propria identità generativa dall'idea di città intelligente attraverso le condizioni specifiche dettate dal territorio. In sintesi, la città intelligente ha la finalità di creare l'URBE compatta, connessa, socialmente inclusiva e resiliente, adatta alle esigenze di tutti. Una città in grado di sfruttare il potere della tecnologia, dei dati e dell'innovazione per migliorare la qualità della vita dei residenti e per coordinare e integrare i settori della gestione urbana, territoriale ed ambientale. In una sola parola "Città Sostenibile", una vera rivoluzione. Un modella di città che produrrà la sua nuova identità storica fortemente connessa al passato, perchè frutto di essa, ma con un taglio futurista. Da qui nasce l'esigenza di un processo di trade off in una visione di ri-pianificazione del continuum composto da passato, presente e futuro che consentirà il superamento della situazione attuale in una condizione evolutiva senza precedenti, sicuramente sconosciuta.*" Agrosi G. (a cura di) La *Smart City* e la città comoda. Una nuova realtà futurista "smartiana". Mimesis Edizioni, 2022

[4] Bonomi A., Masiero R. (2014), Dalla *smart city* alla *smart land*, Agenda Marsilio Editore, Padova.

[5] Fondazione Francesco Fabbri, https://www.fondazionefrancescofabbri.it/it/about/governance/roberto-masiero/

È, infatti, altrettanto cruciale porre attenzione ai piccoli centri urbani in periferia insieme alle aree rurali, che costituiscono una parte significativa del territorio italiano ed europeo[6]. Grazie alla tecnologia e all'aumentata consapevolezza ambientale, si sono aperte ampie opportunità per lo sviluppo intelligente di questi territori. È emerso che l'innovazione digitale può apportare considerevoli vantaggi ai centri rurali, potenziando i servizi e preservando le caratteristiche distintive, coniugando tradizione e innovazione. Da considerare è anche il fatto che queste aree interne europee ospitano circa 93 milioni di cittadini[3], rendendo essenziale promuovere uno sviluppo intelligente.

Masiero sostiene, infatti, che focalizzarsi solo sullo sviluppo urbano potrebbe portare a uno squilibrio tra le aree urbane e rurali, rischiando l'emarginazione di queste ultime. La proposta della *Smart Land* (*Fig. 3*), invece, si basa sull'idea che l'innovazione tecnologica debba diffondersi in modo omogeneo su tutto il territorio, includendo sia le città che le aree rurali (World Bank, 2019). Questo approccio mira a sfruttare le potenzialità delle comunità rurali, preservandone le tradizioni e valorizzando le risorse locali attraverso l'adozione di soluzioni tecnologiche e innovative. Le città, diventano, dunque, supporto fondamentale per i piccoli centri urbani, colmando il *gap* attualmente esistente[7]. Aiutano, così, nella valorizzazione delle risorse locali e del patrimonio in genere, al non sovraffollamento di alcuni centri, oggi definiti nevralgici, rispetto ad altri meno popolati e soggetti a spopolamento, tuttavia, implica diversi aspetti tra cui:

- fornire accesso alle tecnologie dell'informazione e della comunicazione *(ICT)* come la connettività ad alta velocità e le soluzioni *IoT (Internet of Things)* (U.N., 2020);
- applicare soluzioni tecnologiche per promuovere la sostenibilità ambientale, come l'uso delle energie rinnovabili e pratiche agricole ecosostenibili, consentendo alle comunità rurali di svilupparsi in modo ecocompatibile;
- valorizzare le tradizioni e il patrimonio culturale delle aree rurali, mantenendo la loro identità unica mentre si abbraccia l'innovazione;
- implementare soluzioni di mobilità sostenibile nelle aree rurali, come il trasporto pubblico ecologico e le infrastrutture per la mobilità dolce, contribuendo all'accessibilità e alla connettività;
- coinvolgere attivamente le comunità locali nello sviluppo di strategie e progetti, promuovendo la collaborazione e la condivisione di idee;
- favorire lo sviluppo di nuove imprese locali e opportunità di lavoro, sfruttando le risorse esistenti e creando nuove prospettive economiche.

La prospettiva della *Smart Land* rappresenta una grande opportunità per ridurre gli squilibri tra aree urbane e rurali, creando un tessuto sociale ed economico più equilibrato. Promuovere l'innovazione e l'adozione delle tecnologie in tutte le regioni territoriali potrebbe tradursi in un progresso sostenibile e inclusivo per l'intera comunità nazionale e ripetersi ed espandersi sia in Europa che oltreoceano. Questo concetto di *Smart Land* prende forma, successivamente in Europa, negli *Smart Villages* (Antonelli, 2019) , che uniscono le tecnologie dell'informazione e della comunicazione (ICT) alle suggestive e remote zone rurali, villaggi, centri minori e paesi. Per comprenderli meglio, possiamo semplificare il concetto confrontandolo proprio con quello di *Smart City*, in cui la tecnologia e l'innovazione digitale migliorano la sostenibilità, i servizi, l'informazione e l'uso di strategie innovative (European Commission, 2017).

L'obiettivo degli *Smart Villages* o Villaggi Intelligenti è migliorare vari aspetti legati alla quotidinità ampliando le possibilità delle aree rurali, tra cui l'efficienza energetica, la connettività, l'accesso ai servizi, la resilienza, la sicurezza, la tutela ambientale, la partecipazione dei cittadini e l'adozione di nuovi modelli di business, di lavoro e di mobilità sostenibili, coadiuvati dall'attiva e fondamentale partecipazione locale (MC Kinsey Global Institute, 2019).

[6] In Europa, le zone prevalentemente rurali rappresentano il 45% dell'area totale, ma sono abitate solo dal 21% della popolazione europea. (Eurostat, 2020)

[7] "*Il nostro è tra i paesi più visitati al mondo non solo per le bellezze dei nostri centri storici: romani, romanici, gotici, barocchi, liberty e déco, ma anche per quel calore di tradizioni in contrasto con la globalizzazione ed è per questo che dobbiamo ri-conoscere e ri-appropriarci della nostra "identità luogale", considerando le recenti trasformazioni mondiali tecnologiche una opportunità di crescita evolutiva di un sistema in miglioramento. Nelle grandi città, ad esempio, siamo costretti a convivere con un numero di abitanti sovradimensionato rispetto alla capacità estensiva del territorio che genera disordine sociale svilente e confusionale. L'assenza quasi totalitaria di spazi verdi e di luoghi armonici condiziona e altera lo status naturale dell'essere umano, quindi nasce l'esigenza di ri-progettazione o meglio ancora di restaurare, inteso come restyling , la città, trasformandola in città intelligente con proporzioni vitruviane e palladiana ritmicità, ispirandosi al funzionamento della macchina perfetta per eccellenza che esiste al mondo: il corpo umano e i suoi chakra, centri nevralgici della energia e del funzionamento fisico. Allo stesso modo dobbiamo concepire la città intelligente e i suoi chakra, basandoci sul funzionamento dei centri energetici nevralgici urbani ed ambientali in sinergia con l'essere umano ed in equilibrio sincronico intersettoriale territorial-connettivale.*" Agrosi G. (a cura di) La *Smart City* e la città comoda. Una nuova realtà futurista "smartiana". Mimesis Edizioni, 2022

La rivoluzione industriale del XX secolo, così come la Pandemia del COVID-19, hanno rivalutato gli *Smart Villages* a partire dal 2020. Questo invita a riflettere sulla loro promozione, favorendo l'alta qualità della vita e adottando un'economia circolare invece di un consumo indiscriminato di risorse globali. L'obiettivo di questo cambio di paradigma è promuovere le risorse endogene del territorio, presenti in misura maggiore in queste aree e offrire valore economico, ad oggi per lo più assente o ancora non abbastanza valorizzato (European Commission, 2015). Tuttavia, è essenziale riqualificare e rivitalizzare adeguatamente i villaggi rurali in ritardo rispetto al progresso.

Questo include il potenziamento delle infrastrutture e delle telecomunicazioni, la copertura di rete, l'espansione delle zone *Wi-Fi*, la produzione di energia sostenibile, la mobilità sostenibile e la riqualificazione delle strutture esistenti sono terre rimaste indietro nel tempo e vittime del processo fagocitativo delle grandi città. Questi cambiamenti portano inevitabilmente al potenziamento del settore turistico, a considerare nuove strategie come lo *smart working*, chiave per incrementare domanda e offerta, trasformando, ad esempio, le case vacanza in vere residenze per lavoratori nomadi, o me-

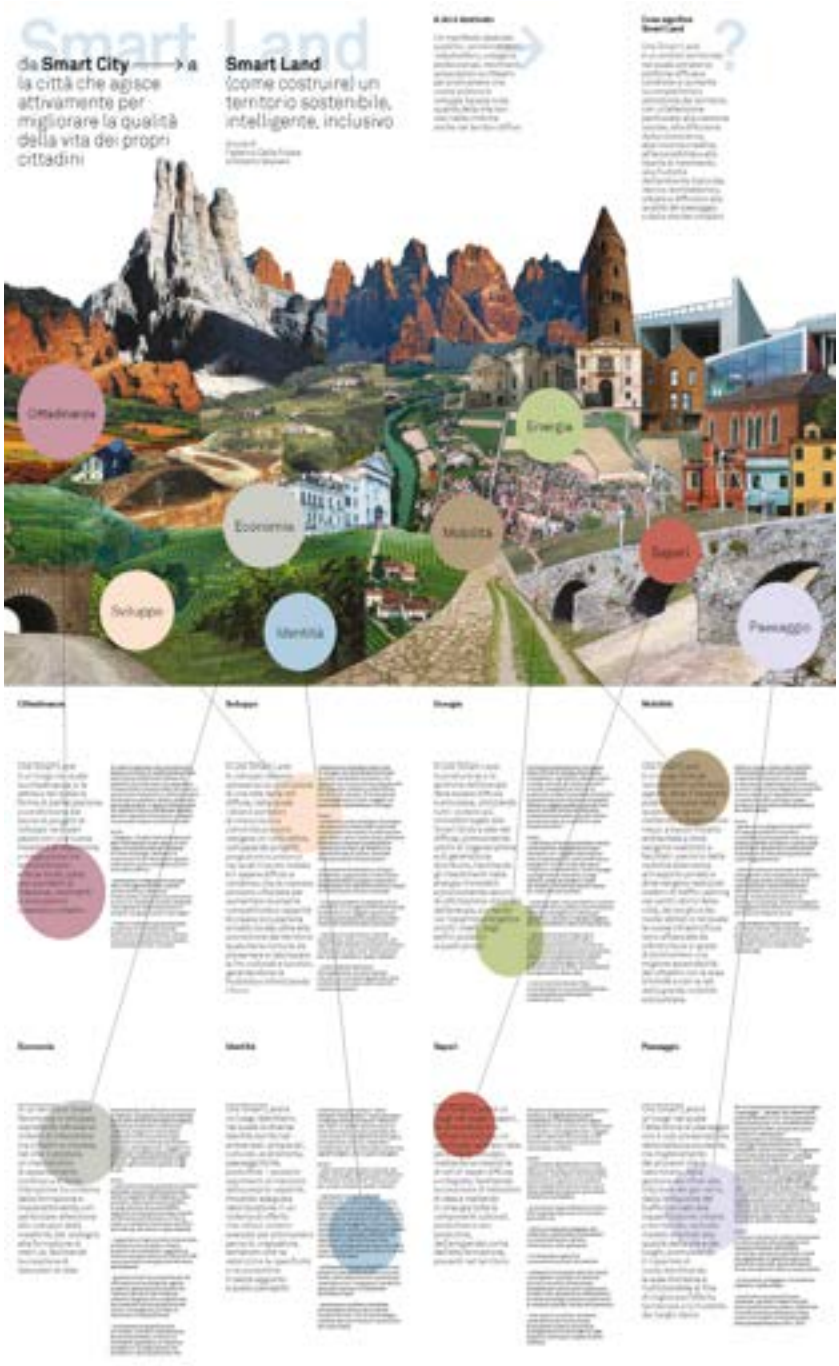


Fig. I.3 | Manifesto della Smart Land, Roberto Masiero in "Dalla smart city alla smart land", 2014.

La storia delle idee traccia traiettorie imprevedibili: il concetto di smart land, elaborato nel 2012 da Roberto Masiero e Fondazione Francesco Fabbri, ha posto territori e persone al centro dello sviluppo, dando vita a molteplici applicazioni e ispirando politiche europee orientate non solo alle smart cities ma, soprattutto, alle smart communities. Un successo condiviso, frutto di intelligenze collettive e visioni convergenti, che continua a guidare riflessioni e innovazioni.

glio ancora, nomadi digitali. Allo stesso modo cambia anche il concetto di abitare e di urbanità, incentivando lo spostamento degli investimenti verso località periferiche per creare una rete di villaggi intelligenti che attraggono manodopera, professionisti, famiglie e imprese.

Comunità all'avanguardia che favoriscono la collaborazione e le connessioni, coinvolgendo varie parti interessate, pubbliche e private, e promuovendo progetti che, altrimenti, non sarebbero realizzabili, senza necessariamente avere una specifica connotazione amministrativa (Barbieri et al., 2018). Diversamente dalle città, queste possono beneficiare della collaborazione tra cittadini e tra piccoli paesi per ottenere le stesse opportunità urbane; è noto, infatti, come all'interno di piccoli contesti territoriali vige un rapporto di vicinato molto più stretto e familiare, *tout court* un grande condominio in cui vige un principio di mutua collaborazione. I progetti da intraprendere devono, dunque, variare in base alle necessità locali, comprendere le vocazioni territoriali e svilupparle, consentendo un intervento mirato risolvendo problematiche come l'abbandono e favorendo il loro ripopolamento come alternativa al caos urbano. Investire nello sviluppo delle reti rurali connesse e degli *Smart Villages* è di importanza fondamentale non solo per il contesto italiano, ma anche per quello europeo. Queste aree costituiscono oltre la metà del territorio europeo, sono abitate da milioni di cittadini che meritano servizi e una qualità della vita paragonabili a quelli offerti nelle grandi città e, in Italia, coprono più del 60% del paese ospitando una parte significativa della popolazione (ISTAT, 2019).

Al fine di raggiungere gli obiettivi di sostenibilità entro il 2030 e il 2050[8], è cruciale porre attenzione a programmi che apportino un contributo significativo all'ambiente e allo sviluppo sostenibile, per una maggiore flessibilità e possibilità di sperimentare nuove soluzioni innovative senza compromettere il paesaggio e l'ambiente. Si può lavorare trasversalmente su vari aspetti, tra cui economia, ambiente, *governance*, stili di vita, mobilità e tecnologia, al fine di promuovere uno sviluppo sostenibile. Sono risorse preziose che, se valorizzate adeguatamente, possono contribuire alla transizione verso un futuro più sostenibile (European Union, 2018).

Investire nella connettività digitale, nelle energie rinnovabili, nell'agricoltura intelligente e in altre soluzioni innovative può favorire la crescita economica, la creazione di posti di lavoro, la tutela dell'ambiente e l'aumento della qualità della vita nelle comunità rurali. Adottare un approccio olistico che coinvolga una vasta gamma di attori, tra cui governi locali, imprese, istituzioni accademiche e la stessa comunità, è fondamentale per sviluppare strategie e progetti mirati (European Union, 2021). L'obiettivo è, tuttavia, creare *Smart Villages*, network di villaggi, che siano al passo con i tempi, in grado di offrire servizi efficienti, sostenibili e inclusivi, migliorando la vita delle persone e preservando l'identità culturale e ambientale delle comunità rurali (World Bank, 2016) al pari della città comoda che si voleva raggiungere con la *Smart City*. Villaggi dinamici in cui il cambiamento e tecnologia, strategie e innovazioni camminano di pari passo. Soluzioni innovative per migliorare la resilienza, partendo dai punti di forza e dalle opportunità locali, un approccio che coinvolge la comunità per sviluppare strategie mirate a migliorare le condizioni economiche, sociali e ambientali. Villaggi che traggono vantaggio dalla collaborazione con altre comunità sia urbane, ma soprattutto rurali e che possono essere finanziati sia pubblicamente, attingendo a fondi europei, che privatamente per via del potenziale che possiedono e per un principio di mutua collaborazione comune e diversificato dagli sconosciuti cittadini. Costituiscono una grande opportunità per il miglioramento della qualità di vita, sviluppando un'economia più sostenibile e resiliente (European Commission, 2017). Negli *Smart Villages* è, dunque, possibile realizzare una vasta gamma di progetti specifici, a seconda delle necessità locali e delle caratteristiche della comunità (United Nation, 2017), tra questi esempi di progettualità.

- **infrastrutture digitali:** Implementazione di reti ad alta velocità e connettività Internet nelle aree rurali per consentire l'accesso alle tecnologie

[8] Agenzia per la Coesione Territoriale, "Agenda 2030 per lo Sviluppo Sostenibile", https://www.agenziacoesione.gov.it/comunicazione/agenda-2030-per-lo-sviluppo-sostenibile/

digitali, promuovere l'e-commerce, migliorare l'istruzione a distanza e facilitare la telemedicina proprio per la mancanza, il più delle volte, di strutture sanitarie;

- **energia sostenibile:** Promozione di soluzioni energetiche rinnovabili e intelligenti, come l'installazione di pannelli solari, l'uso di microreti elettriche e sistemi di stoccaggio dell'energia, per ridurre l'impatto ambientale e migliorare l'efficienza energetica nelle comunità rurali e garantire edifici *smart* e innovativi;
- **agricoltura intelligente:** Adozione di tecnologie agricole avanzate, come l'agricoltura di precisione, l'uso di sensori per il monitoraggio delle colture, l'automazione dei processi agricoli e l'implementazione di sistemi di irrigazione intelligente per migliorare la produttività e la sostenibilità agricola nonchè una produzione maggiore;
- **mobilità sostenibile:** Promozione di soluzioni di trasporto sostenibili, come il carpooling, il bike-sharing, i veicoli elettrici e l'implementazione di infrastrutture per la ricarica degli veicoli elettrici, al fine di ridurre l'inquinamento e migliorare la mobilità nelle aree rurali;
- **servizi intelligenti:** Sviluppo di servizi pubblici digitali avanzati, come l'e-government, la gestione intelligente dei rifiuti, l'illuminazione pubblica efficiente, l'implementazione di sistemi di sicurezza intelligenti e l'uso di soluzioni di domotica per migliorare la qualità della vita nella comunità;
- **turismo sostenibile:** Valorizzazione del patrimonio culturale e naturale delle aree rurali attraverso l'utilizzo di tecnologie digitali, la creazione di esperienze turistiche innovative, l'implementazione di sistemi di gestione del turismo sostenibile e la promozione di attività turistiche a basso impatto ambientale;
- **economia locale e imprenditoria:** Sostegno all'innovazione e all'imprenditoria locale attraverso l'implementazione di spazi di coworking, l'organizzazione di programmi di formazione e supporto per le startup, la promozione di filiere produttive locali e la creazione di reti di collaborazione tra imprese.
- **recupero e valorizzazione del patrimonio:** promozione dell'architettura tradizionale considerando innovazione e compatibilità tecnologica.

Questi sono solo alcuni dei temi e idee che possono essere realizzate per promuovere *Smart Villages* e questo lavoro di tesi si prefigge l'obiettivo di analizzarli uno ad uno. La specificità e la diversità di ognuno di questi dipendono, tuttavia, dalle esigenze e dalle risorse delle singole comunità, nonché dalla volontà di collaborazione tra i vari attori coinvolti. È opportuno sottolineare che non tutte le strategie sopra elencate possono essere adottate in tutti i contesti, ma possono essere versatili e promosse in chiave diversa (Al Nuaimi et al., 2018) in base alla loro compatibilità territoriale. Per continuare gli studi pregressi (Fig.3), in questi anni di ricerca, sono state esaminate, infatti, le politiche di supporto ai "villaggi intelligenti", considerando strategie internazionali, europee e italiane e sono stati forniti casi studio concreti per una visione completa del lavoro svolto sin d'ora e in grado di trovare soluzioni innovative ed efficaci da intraprendere con solide basi e con un percorso ben delineato in grado di considerare diversi aspetti (Fig.4). Le schede dei casi studio, presenti in appendice all'interno dell'Allegato 1 - *Case Study Booklet*, sono schede strutturate che riportano informazioni su specifici casi di studio o esempi concreti di villaggi intelligenti riscontrati in questi anni di ricerca attraverso sopralluoghi o tramite la letteratura scientifica. Nella schedatura, di seguito proposta, sono stati utilizzati, e ideati, per analizzare e presentare dati, risultati e conclusioni in modo chiaro e sistematico, nel dettaglio verranno presi in considerazione:

- **Introduzione:** Breve introduzione al caso studio e alla sua rilevanza; Descrizione del contesto in cui si è verificato il caso studio. Incluse informazioni come il luogo, il periodo di tempo, le parti coinvolte, ecc.;
- **Obiettivi e Metodologia:** Obiettivi specifici dello studio o dell'analisi del caso; Descrizione del metodo o dei metodi utilizzati per raccogliere

dati, condurre l'analisi e ottenere risultati;
- **Risultati:** Presentazione dei dati e dei risultati ottenuti dall'analisi del caso studio. Puoi utilizzare grafici, tabelle e altri strumenti visivi per rendere più chiari i risultati;
- **Tematiche trattate:** Sintesi delle principali conclusioni tratte dal caso studio;
- **Riferimenti:** Elenco di tutte le fonti utilizzate per raccogliere dati o informazioni relative al caso studio.

Ogni caso studio può presentare variazioni nella sua struttura, che dipendono dalle esigenze specifiche e dal contesto, nonché dalla reperibilità delle informazioni. Tuttavia, l'elemento cruciale è rappresentato dalla presentazione delle informazioni in modo chiaro, coerente e completo al fine di ottenere esempi solidi su cui basare il lavoro e il progetto nel territorio madonita. Nei paragrafi successivi, verrà esaminato il tema degli *Smart Villages* come introduzione per comprendere appieno le schede riepilogative ed esempi esplicativi e dei casi studio che sosterranno la ricerca dottorale.

Le città future non sono né quelle invisibili di Italo Calvino né quelle visionarie di Fritz Lang. Sono quelle attuali, viste e abitate con una prospettiva più efficiente, al contempo tecnologica e creativa, soprattutto partecipata.

Mattei M.G. (2013) "Carlo Ratti. Smart city, smart citizenz."
Egea Edizioni.

Fig. I.4 | Journey to become a Smart Village © UNCEM - Unione Nazionale Comuni Comunità Enti Montani 2020.

Sebbene molti villaggi intelligenti siano emersi nel corso degli ultimi decenni, il concetto di Smart Villages è relativamente recente. È stato ufficialmente formulato per la prima volta nel 2017 nell'ambito dell'EU Action for Smart Villages dalla Commissione Europea, su iniziativa del Parlamento Europeo. Tra il 2018 e il 2019, la Commissione Europea ha lanciato il Progetto Pilota sugli Smart Eco-Social Villages, mirato a fornire una definizione esaustiva di Smart Villages e a identificare buone pratiche e casi studio rilevanti. È importante notare che ogni Stato Membro può adottare una propria definizione di Smart Villages, adattandola al contesto nazionale seguendo una linea comune come sopra.

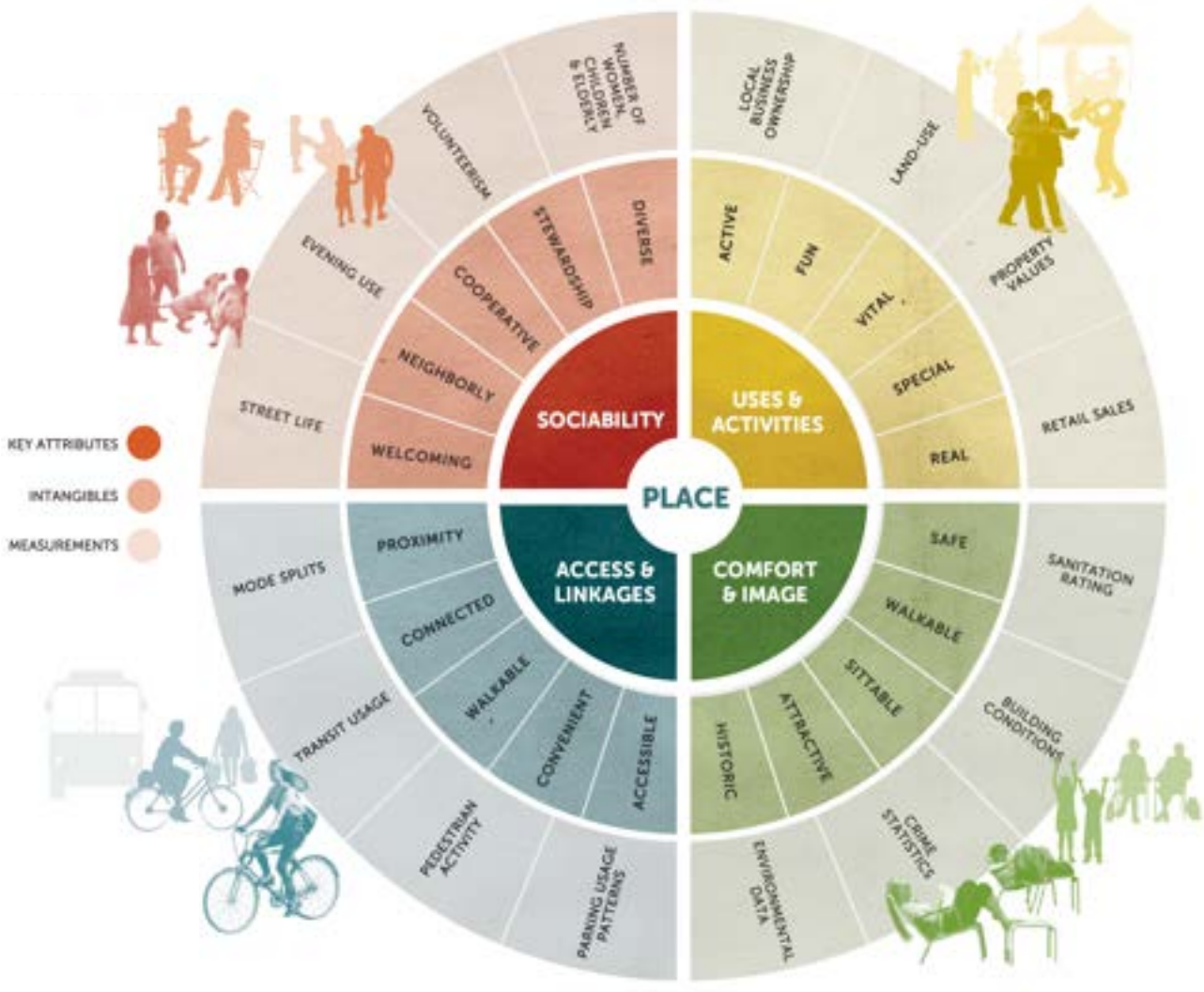


Fig. I.5 | Smart Map for a Smart Village © Project for Public Spaces, 2021.

L'immagine illustra gli approcci essenziali per la creazione di uno Smart Village a livello globale. Lo schema evidenzia le quattro macroaree fondamentali: socialità, utenti e attività, accessibilità e connessioni, comfort e decoro, che sono condivise come principi guida per lo sviluppo di un villaggio intelligente. Questo diagramma serve come supporto per comprendere le dinamiche interconnesse necessarie per promuovere un ambiente urbano e rurale innovativo, sostenibile e inclusivo.

I.1 Analisi della letteratura scientifica relativa agli Smart Villages

Il concetto di *Smart Village* non è una novità degli ultimi anni, se ne parla già a partire dal 2007 in tutto il mondo, con alcune ricadute in Europa a partire dal 2017, grazie al Piano d'azione dell'UE per i villaggi intelligenti che, finalmente, riconosce una valenza del patrimonio rurale, da tutelare e valorizzare (Lattanzi et al., 2019).

La letteratura scientifica relativa alla *Keyword* S*mart Village* nel periodo compreso tra l'anno 2018 e il 2022 (*Fig. 1*), presenta un picco con circa 1.374 ricerche scientifiche che trattano il tema intrapreso. In questo stesso intervallo temporale, i paesi con economie emergenti e in via di sviluppo hanno registrato un aumento corposo nella creazione di villaggi intelligenti, contrariamente alle aspettative tradizionali mostrando una connessione profonda e sempre più forte tra la ricerca scientifica e l'innovazione applicata a livello locale.

La tendenza di una maggiore produzione scientifica nei paesi in via di sviluppo, in concomitanza con lo sviluppo dei villaggi intelligenti, evidenzia la capacità di questi paesi di abbracciare l'innovazione scientifica e applicarla con successo a livello pratico. Questo fenomeno non solo rivela la diversità del panorama scientifico globale, ma sottolinea anche l'importanza di considerare fattori locali e globali nella promozione dello sviluppo sostenibile e delle comunità intelligenti.

Una produzione particolarmente significativa corrisponde ai paesi dell'India e dell'Indonesia, seguiti dagli Stati Uniti (*Fig. 2*). Questo fenomeno, apparentemente paradossale, ha rivelato una correlazione tra lo sviluppo di villaggi intelligenti e un focus ancora più rilevante nei paesi economicamente più svantaggiati, seguiti, poi da casi più all'avanguardia dove, tuttavia, risulta anche più facile riscontrare progettualità possibili.

Le tematiche dominanti all'interno di questa proliferazione scientifica (*Fig. 3*) riguardano principalmente materie come *Computer Science*, Scienze Sociali, Ingegneria, Ambiente Sostenibile ed Energia. Questo evidenzia una grande sinergia tra la ricerca accademica e le esigenze pratiche delle comuni-

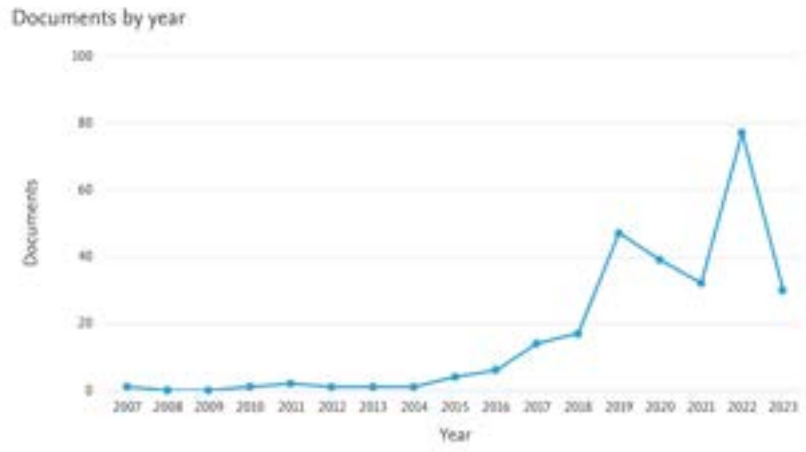


Fig. I.1.1 | Documenti in letteratura scientifica relativi al tema degli Smart Villages per anno di pubblicazione, ©Scopus, 2023.

tà locali, specialmente in contesti in via di sviluppo. L'attenzione dedicata all'informatica, alla digitalizzazione e alle scienze sociali riflette la crescente importanza di soluzioni tecnologiche e strumenti sociali nell'ambito della costruzione di villaggi intelligenti, in cui il primo passo risulta la connessione con il resto del mondo. Il settore dell'ingegneria gioca, infatti, un ruolo chiave in questa dinamica, poiché fornisce le fondamenta per l'infrastruttura avanzata necessaria a sostenere la trasformazione dei villaggi in comunità intelligenti. Contestualmente, la crescente consapevolezza ambientale ha portato a un considerevole interesse per l'ambiente sostenibile ed energie alternative, elementi cruciali per garantire uno sviluppo equo e sostenibile.

Le analisi effettuate sono state rilevate attraverso l'utilizzo di piattaforme scientifiche come Scopus, di riferimento nel mondo accademico per la ricerca, e la consultazione di articoli scientifici e di letteratura specializzata. Fondata su una vasta raccolta di dati provenienti da fonti autorevoli, offre un panorama esaustivo delle pubblicazioni scientifiche globali garantendo la reperibilità delle informazioni in tutto il globo. La piattaforma, che agisce come un faro per ricercatori, studenti e professionisti desiderosi di approfondire le proprie conoscenze su un determinato argomento, ha permesso di identificare e mettere in evidenza le ricerche in atto e la tendenza progettuale attuale legata al tema.

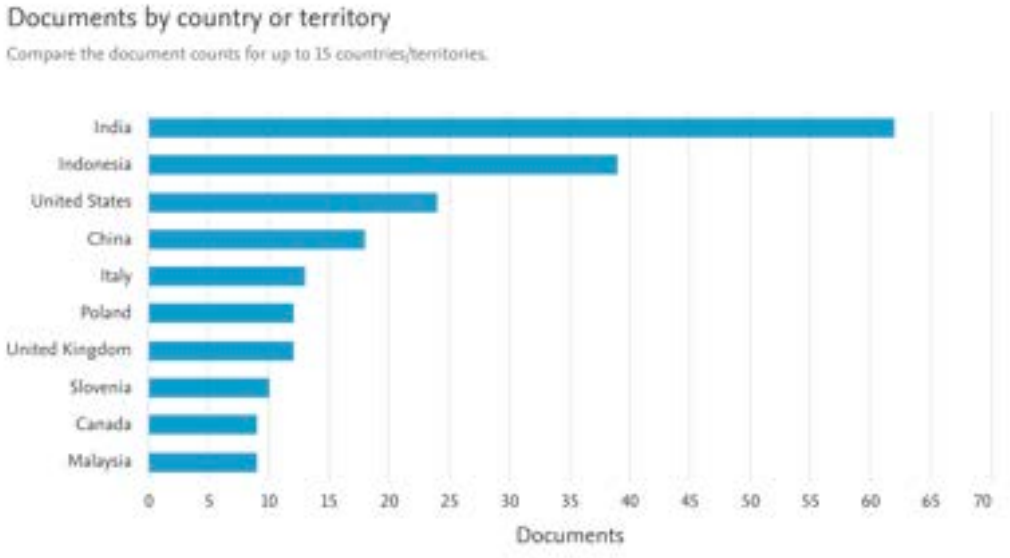


Fig. I.1.2 | Documenti in letteratura scientifica relativi al tema degli smart villages per area geografica, ©Scopus, 2023.

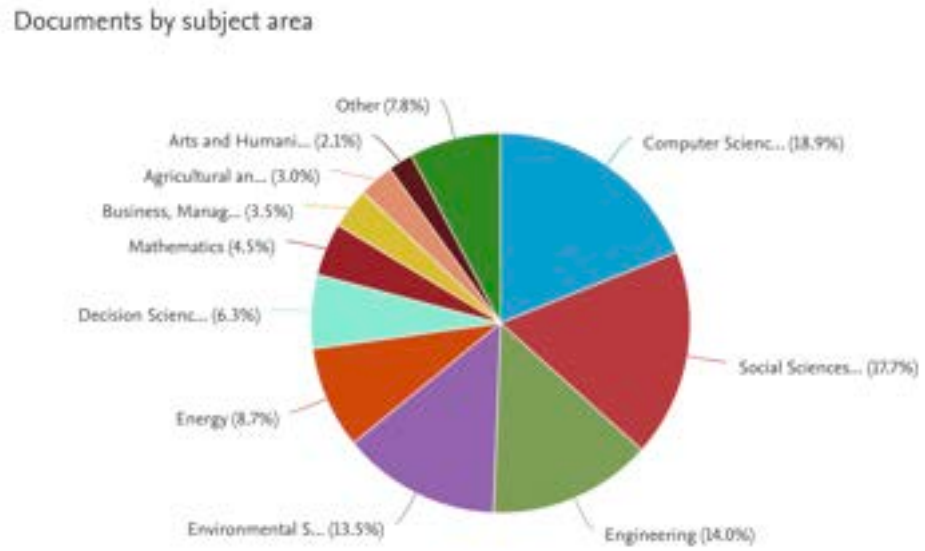


Fig. I.1.3 | Documenti in letteratura scientifica relativi al tema degli Smart Villages per area tematica, ©Scopus, 2023.

I.1.1 Criteri SMART: definire e raggiungere obiettivi con precisione e successo

Il termine *Smart* di cui discusso sino ad ora, non è casuale ed è pertanto opportuno specificare con esattezza come l'acronimo che lo compone sia declinato in plurime eccezioni che necessitano una definizione specifica al fine di comprendere come questa sia influente nel percorso di formazione degli *Smart Villages* a livello extraeuropeo, europeo e italiano.

La metodologia degli obiettivi *Smart*, coniata per la prima volta nell'opera "*Attitude Is Everything: If You Want to Succeed Above and Beyond*" di Paul J. Meyer[1] *[...]*, imprenditore e autore statunitense, costituisce un approccio preciso e strutturato per la definizione degli obiettivi, rendendoli più gestibili e orientati al successo, anco di più se associati al concetto di villaggio, riesce già a far comprendere le possibili direzioni e i possibili orientamenti da intraprendere.

Questo acronimo rappresenta, infatti, cinque caratteristiche fondamentali che ogni obiettivo dovrebbe possedere: *Specific, Measurable, Archievable, Relevant e Time-Based.*

Esaminando ciascuna di queste componenti:

- **Specific** (Specifico): Gli obiettivi di rilevanza e portata significative risultano ben definiti e focalizzati. Il livello di specificità genera un impatto considerevole, in quanto la chiarezza dell'obiettivo funge da forza attrattiva, concentrando le energie verso il conseguimento e attirando le risorse necessarie calato nel contesto degli *Smart Villages* la specificità valorizza le risorse territoriali;
- **Measurable** (Misurabile): Un obiettivo privo di una misurazione risultante è paragonabile a una competizione sportiva sprovvista di un tabellone segnapunti: i numeri costituiscono un elemento essenziale del processo. L'inserimento di parametri misurabili, come ad esempio guadagnare un determinato importo in un periodo specifico o acquisire un numero definito di nuove abilità entro un mese, fornisce un riferimento tangibile per valutare il progresso. Misurare la *smartness* dei territori in fase iniziale e finale garantisce la fattibilità del processo;
- **Achievable** (Raggiungibile): La tendenza a fissare obiettivi al di là delle proprie capacità è diffusa, ma per garantire la realizzabilità, è cruciale mantenere una prospettiva realistica. Sebbene ambiziosi, gli obiettivi dovrebbero ancorarsi alla realtà per evitare frustrazioni. L'invito a sognare in grande è ponderato dalla necessità di mantenere un piede saldamente ancorato alla realtà. Compatibilità e concretezza sono necessari per uno sviluppo sostenibile e possibile;
- **Relevant** (Rilevante): L'importanza di un obiettivo, rispetto ad altri, è fondamentale per sostenere la motivazione nel tempo. Solidi argomenti sono indispensabili per alimentare un impegno duraturo. Nel contesto territoriale delle aree interne, la rilevanza è ulteriormente accentuata dalla considerazione del peso specifico dell'obiettivo da raggiungere in relazione agli attuali risultati e alle peculiarità territoriali;
- **Time-Based** (Basato sul tempo): Qualunque obiettivo può essere effettivamente raggiunto solo quando è associato a una scadenza definita, catalizzatore motivazionale essenziale. La pianificazione, aggiornata sempre in base ai progressi, costituisce un elemento cruciale per uno sviluppo motivato e razionale.

L'impiego del termine *Smart* quando ci si riferisce alle aree rurale e ai centri minori, o *villages*, dunque, è essenziale, in quanto sottolinea quanto l'implementazione di soluzioni tecnologiche avanzate, mirate a ottimizzare l'efficienza, favorire l'innovazione e promuovere la sostenibilità può contribuire a contesti all'avanguardia (Pagliari et al., 2018).

Tale terminologia evidenzia, dunque, quanto l'adozione di pratiche moderne può migliorare la qualità della vita, la connettività e stimolare lo sviluppo economico locale partendo da uno schema prestabilito che tenga conto di questi cinque fattori di partenza.

[1] Meyer P. J. (2003), Attitude Is Everything: If You Want to Succeed Above and Beyond, Meyer Resource Group Publisher.

[...] *The term 'smart' has become so inflated as to be almost devoid of meaning. It's used to describe anything from an appliance to a two-year-old child. But what does it really mean to be smart?.*

Fig. I.1.1.1 | Smart criteria, ©Luisa Lombardo, 2024.

La sostenibilità sarà il criterio di valutazione del funzionamento del centro minore di produrre e riprodurre beneifici costanti a tempo indeterminato nei diversi ambiti: finanziario, economico, istituzionale, socio-culturale, ambientale e tecnologico. L'integrazione di sistemi fisici, digitali e umani nell'ambiente costruito offre un futuro sostenibile, prospero e solidale ai cittadini attraverso il funzionamento ottimale di un *village service hub*.

Gli step da seguire per la realizzazione sono i seguenti:

1. **studio della città e generazione del suo profilo** attraverso la creazione di una *city service hub*, intesa come modello/prototipo di una versa e propria *Smart City*.
2. **raccolta di informazioni essenziali sul campo** con interviste al cittadino, ai commercianti ed agli imprenditori, attraverso la predisposizione di schede che mirino a far emergere le necessità primarie e secondarie.
3. **creazione di un programma *smart*** con partnership pubblico-privata (PPP Programme), che supporti le istituzioni pubbliche nella gestione della *Smart Village*.
4. **sviluppo di un sistema per l'economia circolare**;
5. **identificazione delle sfide e delle opportunità** inserite nel quadro di una riorganizzazione economico-sociale del territorio, dove sarà necessaria un'azione di riprogettazione delle funzioni primarie dei servizi del e al cittadino in un city service *hub*, ovvero parti strategiche della città che svolgeranno la funzione di poli di servizi (parcheggi, mobilità urbana, trasporti pubblici e attività commerciali) di condivisione e anche di aggregazione supportate da una "agorà digitale";
6. **trasferimento in rete** di tutte le informazioni possibili per sviluppare progetti sempre più vicini al cittadino. Fermo restando che le informazioni raccolte sul territorio daranno vita ad una nuova lista di esigenze che il cittadino manifesterà durante le interviste;
7. **creazione di un *action plan* strategico ed una roadmap** per tracciare tutti i punti che dovranno essere sviluppati a seconda delle necessità manifestatesi durante le interviste ed i sopralluoghi;
8. **creazione di una piattaforma digitale come agorà** virtuale per operatori pubblici, privati e cittadini: *una agorà on line*, dove risulta semplice interfacciarsi con la Pubblica Amministrazione e con un sistema di *partner* pubblici e privati a cui proporre progetti di *start-up* e sfide di modernizzazione dei sistemi dei servizi offerti e integrati con la domanda.

Fig. I.1.1.2 | Un'idea di Smart Village, ©Luisa Lombardo, 2024.

I.2 Smart Villages extraeuropei e schedatura casi studio

Nel contesto attuale, in cui solo poco più della metà della popolazione globale ha accesso a Internet e la restante metà rimane ancora sconnessa, la pandemia globale del COVID-19[1] ha messo in luce l'importanza vitale delle reti e dei servizi digitali per la resilienza economica e la continuità dei servizi pubblici essenziali, come l'istruzione e l'assistenza sanitaria. In questo scenario, la collaborazione e le *partnership multi-stakeholder* si rivelano fondamentali per raggiungere le comunità sottoservite e non connesse e per perseguire l'obiettivo di una connettività universale e significativa. È proprio nelle aree rurali che questa esigenza si presenta maggiormente con questa prospettiva, l'Unione Internazionale delle Telecomunicazioni (ITU) e i suoi partner hanno promosso la creazione di villaggi intelligenti per favorire lo sviluppo sostenibile nelle aree remote e svantaggiate del mondo.

I primi villaggi intelligenti, infatti, sono emersi al di fuori dell'Europa, in particolare nei paesi in via di sviluppo come l'Africa, l'India, l'Indonesia e il Nepal. Queste regioni, dove le opportunità di crescita sono limitate e molto lavoro deve ancora essere fatto, forniscono un punto di partenza da cui costruire da zero. Il termine "villaggi intelligenti" circa 13 anni fa dall'idea di promuovere lo sviluppo di aree che, per noi, potrebbero essere considerate piccole comunità rurali, ma che per le aree economicamente svantaggiate sono una collezione di piccoli villaggi uniti dalla mancanza di beni e servizi essenziali necessari per garantire una vita dignitosa ai loro abitanti. In risposta alla volontà di aiutare coloro che hanno meno di noi, numerose organizzazioni *non-profit*, associazioni e anche grandi multinazionali hanno intrapreso azioni per assistere queste comunità più bisognose.

Mentre il termine "intelligente" è spesso associato al mondo digitale, osservando i vari progetti intrapresi in tutto il mondo, emerge come esso sia collegato anche all'uso e allo sfruttamento delle risorse naturali per creare nuove imprese e promuovere prodotti autoctoni, favorendo l'ingresso nel grande mercato internazionale e promuovendo pratiche di sviluppo sociale ed economico. Questo implica soprattutto l'utilizzo di strumenti digitali per promuovere cultura e innovazione, fornire istruzione alle donne, garantire una gestione sostenibile delle risorse, sfruttare le fonti energetiche rinnovabili e, infine, promuovere un'identità locale spesso sconosciuta. Pertanto, il termine "intelligente" è associato proprio all'uso sapiente dell'intelligenza digitale per attivare processi virtuosi di sviluppo locale, che si basano non solo su grandi investimenti economici, ma anche su un enorme ed imprescindibile investimento di capitale umano.

Ciò che rende veramente intelligenti questi villaggi è la collaborazione tra la popolazione residente che apporta quel valore aggiunto necessario per raggiungere parametri sostenibili e concreti di vivibilità e dignità. L'unione tra i cittadini rappresenta il vero successo, guidati, inoltre, dalla volontà di superare le proprie capacità e potenzialità, e soprattutto di ottenere un senso di *empowerment* con l'obiettivo di raggiungere risultati migliori e più soddisfacenti a lungo termine, al fine di essere equiparati ai paesi in via di sviluppo, decisamente più avanti.

Esplorando una serie di villaggi intelligenti identificati in tutto il mondo, escludendo quelli in Europa e in Italia in quanto gestiti da politiche e *go-*

[1]Dallo studio condotto dall'Unione Europea, si è analizzato l'impatto della pandemia da coronavirus sulle disparità economiche e sociali tra aree urbane e rurali. La ricerca, basata su dati raccolti in tre fasi differenti (primavera 2020, estate 2020, primavera 2021) e presentata su TerritoriALL, rivista specializzata in analisi regionali curata dal programma di studi Espon, ha rivelato un aumento del divario tra questi due contesti, soprattutto in alcuni Stati membri dell'Europa centro-orientale, quali Ungheria, Romania e Bulgaria.

In particolare, è emerso che un anno dopo l'inizio della pandemia, la percentuale di persone che hanno sperimentato difficoltà economiche nelle aree rurali è cresciuta di circa il 7% rispetto alle aree urbane, rispetto ad una differenza del 5% registrata solo un anno prima. Questa tendenza è stata osservata nella maggior parte degli Stati membri, sebbene con variazioni significative.

Le difficoltà finanziarie nelle aree rurali sono state evidenziate come un problema concreto, con il 70% delle persone in Bulgaria, Ungheria, Lituania e Romania che ha segnalato difficoltà nel bilancio familiare. In Croazia, Grecia e Slovacchia, questa percentuale è risultata ancora più alta. Al contrario, nelle città, la percentuale di coloro che hanno segnalato difficoltà finanziarie è stata significativamente inferiore.

Le sfide finanziarie segnalate dagli intervistati includono difficoltà nel pagare bollette, affitti e mutui. È aumentata anche la percentuale di coloro che non possono permettersi di pagare le utenze essenziali come elettricità, acqua, gas e connessione telefonica. Inoltre, l'8,10% degli intervistati nelle aree rurali ha dichiarato di non poter sostenere i costi di affitto o mutuo. I ricercatori attribuiscono queste disparità principalmente ai livelli inferiori di reddito e risparmio nelle aree rurali rispetto alle aree urbane. Di conseguenza, l'impatto a lungo termine della pandemia sul divario tra città e campagne dipenderà dalla capacità delle comunità rurali di affrontare le sfide poste dalla crisi e di garantire un'adeguata transizione verso una "nuova normalità" che non le lasci indietro.
Tratto da ANSA, [ultimo aggiornamento: 29 dicembre 2021]

vernance notevolmente diverse, emergono esempi di successo in particolare negli Stati Uniti e in Asia, ma anche in altre parti del globo. Il punto di partenza non è la carenza di popolazione, bensì la carenza di servizi e talvolta la povertà diffusa. Uno *Smart Village* può essere anche particolarmente popolato, è la mancanza di opportunità e la volontà di implementazione tecnologica a promuovere uno sviluppo territoriale condiviso. Negli Stati Uniti, ad esempio i villaggi intelligenti si sono diffusi in diverse regioni con l'obiettivo di rivitalizzare le comunità rurali e promuovere lo sviluppo sostenibile. Ad esempio, *Chattanooga* (Fig.1) nel Tennessee è famosa come una delle prime località intelligenti degli Stati Uniti, grazie all'implementazione di reti a banda larga ad alta velocità e all'accesso a Internet nelle zone rurali circostanti, che ha favorito la crescita di imprese tecnologiche e la creazione di posti di lavoro nel settore dell'informazione e delle comunicazioni. *Fresno*, in California, ha adottato un approccio all'agricoltura intelligente sfruttando l'*Internet of Things* (IoT) per monitorare i dati agricoli e ottimizzare l'irrigazione, riducendo così il consumo di acqua e aumentando la resa delle colture. *Jefferson*, in Iowa, è diventata un esempio di villaggio intelligente grazie all'utilizzo di energie rinnovabili come l'eolico e il solare, contribuendo a ridurre le emissioni di carbonio e promuovendo la sostenibilità energetica *(Rural Broadband Access Loan and Loan Guarantee Program - RBALGP; Rural Development Broadband Initiative (RBDI), - Rural Utilities Service (RUS)*: ufficio per prestiti, sovvenzioni e altri aiuti finanziari per aiutare le comunità rurali a fornire servizi pubblici, tra cui l'elettricità, l'acqua, il gas naturale e la banda larga).

In Asia, ad esempio, *Kerala* (Fig.2), in India, ha implementato un modello di villaggio intelligente che punta a migliorare l'accesso ai servizi sanitari e all'istruzione attraverso l'uso delle tecnologie digitali, migliorando così l'accessibilità e la qualità dei servizi grazie a programmi come *(National Smart Village Construction Plan (2014-2020)* e il *National Smart City Construction Plan (2014-2020))*.

Un'altra iniziativa significativa è rappresentata dal *Barefoot College*, un progetto indiano esteso a diverse nazioni africane, come *Kenya, Burkina Faso, Senegal* (*Fig. 3 e 5*) e altre ancora. Questa organizzazione ha adottato un modello di *Smart Village* focalizzato sulla formazione e l'addestramento delle donne delle comunità rurali, chiamate "mamme solari", per costruire e mantenere pannelli solari, fornendo in tal modo energia pulita e sostenibile alle loro comunità.

In Giappone, i villaggi intelligenti sono spesso collegati al concetto di "Società 5.0", che mira a combinare tecnologie avanzate con il benessere umano. Le comunità rurali giapponesi stanno adottando soluzioni innovative per affrontare l'invecchiamento della popolazione, come l'uso di robot per l'assistenza agli anziani e l'implementazione di sistemi intelligenti per il monitoraggio delle condizioni di salute grazie al programma di sviluppo delle comunità rurali intelligenti del 2019.

In Africa, rappresentano un'importante iniziativa per affrontare le sfide che le comunità rurali del continente devono fronteggiare e per promuovere uno sviluppo sostenibile a livello locale. Tra gli esempi di *Smart Villages* in Africa, vi è il *Re:learn Hub* della *CcHub (Co-Creation Hub)* con sede a *LAGOS*, Nigeria. Questo progetto si concentra sull'uso delle tecnologie dell'informazione e della comunicazione (ICT) per migliorare l'istruzione nelle comunità rurali, offrendo spazi e risorse dedicati all'apprendimento digitale e alla formazione degli insegnanti, con l'obiettivo di ridurre il divario digitale che spesso caratterizza queste zone.

Nel Sud Africa, invece, si trova l'iniziativa *Digital Villages* (Fig.4), che si propone di portare le tecnologie digitali nelle comunità rurali del paese, migliorando così l'accesso a servizi essenziali come l'istruzione, l'assistenza sanitaria e la consulenza legale. Tale iniziativa lavora per la costruzione di centri comunitari dotati di accesso a Internet, computer e altre risorse digitali (Programma *Smart Villages* dell'Unione Africana del 2018 e Programma *Smart Villages* del Fondo Monetario Internazionale del 2020).

Fig. I.2.1 | Chattanooga, Tennessee ©Tripadvisor, 2023.

Fig. I.2.2 | Kerala, India ©Saga Magazine, 2023.

Fig. I.2.3 | Barefoot College, Africa ©The New York Time, 2011.

Inoltre, è importante menzionare l'iniziativa *Smart Africa*, che rappresenta un'ambiziosa iniziativa pan-africana volta a promuovere lo sviluppo delle tecnologie dell'informazione e della comunicazione in tutto il continente. Questa è volta al miglioramento dell'accesso all'*ICT*, incoraggiare l'innovazione e promuovere lo sviluppo socio-economico, compresa l'implementazione di progetti simili in diversi stati africani.
Le iniziative menzionate sopra rappresentano solo alcuni esempi di come le tecnologie digitali e innovative stiano contribuendo a trasformare le comunità rurali nei territori extraeuropei e ad affrontare le sfide della ruralità con soluzioni sostenibili e innovative.

Il successo dei villaggi intelligenti al di fuori dell'Europa è stato ottenuto parzialmente ed è ancora in fase di sviluppo grazie a diversi fattori, tra cui la fortissima sinergia tra attori pubblici e privati (principali sostenitori economici di tali iniziative), gli investimenti nelle infrastrutture digitali e il coinvolgimento attivo delle comunità locali e la grande collaborazione con le multinazionali, università ed enti di ricerca. La grande partecipazione delle comunità garantisce una sostenibilità a lungo termine e il benessere delle persone coinvolte, dimostrando che gli *Smart Villages* extraeuropei possono ispirare anche l'Europa a perseguire strategie innovative per il futuro delle aree rurali, promuovendo la sostenibilità, l'innovazione e la prosperità economica al di là dei fondi "calati dall'alto".

Nelle pagine successive di questo paragrafo, sarà effettuata un'analisi approfondita degli *Smart Villages* extraeuropei. L'attenzione sarà focalizzata su varie regioni del mondo, concentrandosi in particolare sugli esempi provenienti dall'America, dall'Asia e dall'Africa, così come sopra enunciati, ma non solo.

Questo per evidenziare quanto gli *Smart Villages* rappresentino una prospettiva innovativa per affrontare le complesse sfide socio-economiche e ambientali che affliggono le comunità rurali in diverse parti del globo. Attraverso l'adozione strategica delle tecnologie digitali e l'implementazione di approcci sostenibili, tali progetti mirano a migliorare la qualità della vita, stimolare lo sviluppo economico e preservare con cura l'identità culturale delle aree rurali coinvolte.
Saranno esplorati gli esempi di *Smart Villages* dove diverse iniziative hanno preso avvio per ravvivare le comunità rurali e capitalizzare le opportunità offerte dall'utilizzo delle tecnologie digitali e sostenibili. Attraverso un'analisi scrupolosa, si mira a fornire un quadro completo delle molteplici iniziative in corso nel mondo e a trarre spunti e ispirazione per affrontare con successo le sfide globali affrontate dalle comunità rurali, perseguendo un futuro sostenibile, inclusivo e rispettoso delle identità culturali e ambientali così come è opportuno perseguire, in egual modo, anche in Europa e nel mondo.

Fig. I.2.4 | Samsung Digital Village, Sud Africa ©ITWeb Africa, 2015.

Fig. I.2.5 | Barefoot College © Varialstudio, 2019.

I.3 Smart Villages europei e schedatura casi studio

Gli *Smart Villages* Europei, al pari di quelli extraeuropei, rappresentano un approccio innovativo volto alla revitalizzazione delle zone rurali mediante l'implementazione di tecnologie digitali e soluzioni sostenibili, come menzionato già per il contesto extraeuropeo. Sfruttando la digitalizzazione e le pratiche sostenibili, gli *Smart Villages* europei promuovono lo sviluppo sociale, economico e ambientale, aprendo la strada a comunità rurali vivaci e resilienti in Europa, abbracciano le tecnologie digitali, le pratiche sostenibili e il coinvolgimento della comunità per migliorare la qualità della vita e promuovere la crescita economica includono diversi elementi chiave, tra cui la priorità della connettività digitale, soluzioni energetiche sostenibili, servizi innovativi, imprenditorialità e la creazione di posti di lavoro, oltre al coinvolgimento sociale e comunitario in via di spopolamento, l'incremento della qualità della vita attraverso servizi migliorati, la promozione della sostenibilità ambientale e l'*empowerment* delle comunità rurali. Contribuiscono principalmente anche a contrastare lo spopolamento, attrarre e trattenere i residenti grazie a opportunità di lavoro e a un ambiente favorevole al benessere. Tuttavia, i Paesi dell'entroterra europeo si trovano ad affrontare alcune sfide, tra cui risorse limitate, barriere normative, resistenza al cambiamento e la necessità di garantire l'inclusione e l'alfabetizzazione digitale nelle aree rurali. In aggiunta sono molto meno le sovvenzioni provenienti da privati, a differenza di quelle pubbliche.

A livello politico, l'Unione Europea (Recommendation of the European Commission, 2016) offre grande sostegno attraverso alcuni strumenti quali la Politica di Coesione[1], la Strategia Europea per la Banda Larga[2], l'Agenda Digitale per l'Europa[3], la Politica Agricola Comune[4] e il Programma Orizzonte Europa[5]. Inoltre, l'Iniziativa Europea per gli *Smart Villages* è stata istituita per coordinare e promuovere l'attuazione di politiche a sostegno di villaggi intelligenti in tutta Europa, facilitando lo scambio di conoscenze e migliori pratiche tra le regioni.

Le politiche europee a sostegno degli *Smart Villages* costituiscono un pilastro fondamentale per la revitalizzazione delle aree rurali attraverso l'innovazione e la digitalizzazione (European Commission, 2016). Attraverso finanziamenti, linee guida e iniziative strategiche, l'UE promuove la connettività digitale, la sostenibilità e l'inclusione sociale negli *Smart Villages*. A differenza degli esempi extraeuropei, l'unione europea lavora in maniera sostanziosa alla promozione di villaggi intelligenti prediligento i fondi a disposizione rispetto alle iniziative privatiste (European Commission, 2010). Queste importanti politiche offrono opportunità di sviluppo economico, così come la creazione di posti di lavoro, la preservazione dell'ambiente e miglioramento della qualità della vita nelle aree rurali europee. L'impegno continuo dell'UE nel sostenere gli *Smart Villages* contribuisce in modo sostanziale a creare comunità rurali resilienti, innovative e proiettate verso il futuro nel panorama europeo.

La Rete Europea per lo Sviluppo Rurale (RESR)[6], ad esempio, rappresenta una piattaforma di collaborazione che riunisce le parti interessate di tutta Europa per promuovere l'innovazione e la sostenibilità nelle aree rurali. Fondata con l'obiettivo di agevolare la condivisione di conoscenze, esperienze e

[1] L'attuazione della politica regionale 2021 -2027 avviene attraverso i seguenti fondi: FESR, FSE+, Fondo di Coesione (l'Italia non è beneficiaria) e Fondo per una Transizione Giusta (JTF), in più il Fondo Europeo per gli Affari Marittimi, la Pesca e l'Acquacoltura (FEAMPA).

[2] L'Agenda digitale europea ha definito come obiettivo di connettività entro il 2020 per tutti i cittadini dell'Unione il target di 30Mbps; la banda minima verso l'utenza per definire il servizio a Banda Ultra Larga (BUL). L'Europa ha poi definito un target di utilizzo dei 100Mbps per il 50% della popolazione. L'Italia ha optato per 100Mbps per l'85% della popolazione.

[3] Lanciata nel 2010 per 10 anni ha stabilito per la prima volta il ruolo chiave delle TIC per il conseguimento degli obiettivi europei. Nel 2015 ha ulteriormente sviluppato l'agenda digitale su tre pilastri: migliorare l'accesso dei consumatori e delle imprese ai beni e servizi digitali in tutta Europa, creare un contesto favorevole affinché le reti e i servizi digitali possano svilupparsi e massimizzare il potenziale di crescita dell'economia digitale.

[4] La Politica Agricola Comune (PAC) rappresenta l'insieme di regole riconosciute dall'Unione Europea, le quali attribuiscono centralità al settore agricolo per promuovere uno sviluppo equo e stabile all'interno dei Paesi membri. La PAC si propone di conseguire i seguenti obiettivi: incrementare la produttività dell'agricoltura; garantire un tenore di vita equo per la popolazione rurale; stabilizzare i mercati agricoli; assicurare la sicurezza degli approvvigionamenti alimentari; e garantire prezzi ragionevoli ai consumatori.

[5] Programma quadro di ricerca e innovazione dell'Unione europea per il periodo 2021-2027. L'obiettivo è rafforzare la base scientifica e tecnologica dell'UE, anche sviluppando soluzioni per affrontare priorità strategiche come le transizioni verde e digitale. Contribuisce, inoltre, al conseguimento degli obiettivi di sviluppo sostenibile e rafforza la competitività e la crescita. Costituisce l'iniziativa di punta dell'UE a sostegno della R&I, dall'ideazione al mercato.

[6] Funge da piattaforma informativa sul funzionamento pratico di politiche, programmi, progetti e altre iniziative di sviluppo rurale e su come perfezionarli per ottenere risultati

migliori. L'obiettivo è quello di raggiungere e coinvolgere chiunque mostri un interesse e un impegno a favore dello sviluppo rurale.

migliori pratiche, e svolge un ruolo cruciale nel sostenere la pianificazione e l'attuazione delle politiche di sviluppo rurale dell'UE. Gli *Smart Villages* in Europa rappresentano una realtà sempre più diffusa e diversificata, presente in varie nazioni del continente. Alcuni dei migliori esempi in Europa includono (Rossi F. et al., 2017):

In Italia, *Damanhur* a Vidracco, in Piemonte, è una comunità intenzionale situata nel nord-ovest dell'Italia. Noto per aver creato un sistema sotterraneo di templi e gallerie artistici, nonché per aver adottato pratiche ecologiche e sostenibili. Damanhur ha sviluppato anche un'organizzazione cooperativa per la gestione delle risorse e la partecipazione democratica dei residenti.

Marmilla Smart Community (Fig,.1), nella subregione geografica della Marmilla in Sardegna, è un progetto incentrato sull'utilizzo delle tecnologie digitali per migliorare i servizi locali, promuovere il turismo sostenibile e sostenere l'economia circolare, contribuendo così al benessere della comunità locale.

Borgo Soandri, nelle Marche, è un antico borgo rurale nelle Marche che è stato riqualificato come *Smart Village*, con un'attenzione particolare alla sostenibilità ambientale e all'uso efficiente delle risorse grazie all'implementazione di un albergo diffuso per incentivare il turismo eco-sostenibile.

Nel resto d'Europa, in Portogallo:

Aldeias Do Xisto, situato nella regione centrale del Portogallo, è un progetto che ha trasformato 27 villaggi abbandonati in destinazioni turistiche sostenibili. Attraverso la riqualificazione degli edifici storici, l'uso di energie rinnovabili e l'offerta di esperienze culturali autentiche, il piccolo villaggio ha contribuito a rivitalizzare le comunità rurali e promuovere il turismo sostenibile. *Tamera* (*Fig. 2*), un villaggio sostenibile situato nell'Alentejo. Progettato come un modello di comunità sostenibile, basato sull'autosufficienza energetica, l'agricoltura biologica e la gestione delle risorse idriche. Tamera è anche impegnata nella ricerca e nell'educazione su temi come la pace, la guarigione ecologica e la cooperazione tra le persone. *Aldeia Solar,* conosciuta per l'uso di fonti di energia rinnovabile e pratiche sostenibili per ridurre l'impatto ambientale e promuovere la sostenibilità.

In Spagna:

Lavafante (*Fig. 3*), nella regione di Asturie, ha adottato tecnologie innovative per la gestione sostenibile delle risorse idriche. Attraverso l'uso di sensori e sistemi intelligenti di irrigazione, Lavafante ha ridotto il consumo di acqua nell'agricoltura e ha implementato pratiche agricole sostenibili per preservare l'ambiente naturale.

Mata De Alcántara: concentrato sull'autosufficienza energetica, la mobilità intelligente e la digitalizzazione dei servizi pubblici, puntando a migliorare la qualità della vita dei residenti in quest'area rurale.

Urdaibai, Paesi Baschi, è una riserva della biosfera nel Paese Basco che ha implementato soluzioni sostenibili per la gestione delle risorse e la promozione del turismo responsabile.

In Danimarca:

Samsø: isola conosciuta come uno dei primi *Smart Villages* a energia rinnovabile al mondo, diventata autosufficiente dal punto di vista energetico, grazie all'uso di energia eolica e solare, nonché alla promozione di pratiche di efficienza energetica. È diventata oggi una destinazione turistica popolare e ha creato posti di lavoro nel settore delle energie rinnovabili.

In Austria:

Schlierbach (*Fig. 4*): villaggio che ha implementato con successo soluzioni intelligenti per l'energia e l'efficienza idrica. Attraverso l'uso di tecnologie avanzate, come il monitoraggio energetico e i sistemi di gestione degli edifici ha ridotto il consumo energetico e promosso l'uso sostenibile delle risorse idriche.

Nei Paesi Bassi:

Schoonschip, è un villaggio galleggiante sostenibile le cui case sono dotate di tecnologie innovative per l'efficienza energetica e l'uso sostenibile delle

Fig. I.3.1 | Marmilla, Sardegna, Italia ©La nuova Sardegna, 2023.

Fig. I.3.2 | Tamera, Portogallo ©Italia che cambia, 2020.

Fig. I.3.3 | Lavafante, Spagna ©Corriere della sera, 2022.

risorse idriche.

<u>In Germania</u>:

Schwerin, nella regione di Mecklenburg-Vorpommern, ha adottato tecnologie intelligenti per l'efficienza energetica degli edifici, la gestione dei rifiuti e la mobilità sostenibile.

Freiburg Vauban (*Fig. 5*) è un modello di sviluppo urbano sostenibile che mette in evidenza tecnologie ecologiche, efficienza energetica e mobilità sostenibile, con uno sguardo attento all'impatto ambientale.

<u>Nel Regno Unito</u>:

Winterton-On-Sea, vicino Norfolk, è una comunità che ha adottato l'energia rinnovabile, come l'energia solare e l'eolico, per alimentare i suoi edifici e ridurre l'impatto ambientale.

<u>In Francia</u>:

La Ferme Du Bec Hellouin, in Normandia, è una fattoria biologica che utilizza tecniche agricole sostenibili e intenzionali per coltivare prodotti alimentari in modo ecologico.

<u>In Svezia</u>:

Hjulsjö, Närke, ha sperimentato l'uso di tecnologie intelligenti per ottimizzare l'energia e ridurre gli sprechi.

Österbymo Smart Village (*Fig. 6*) è una comunità digitalmente connessa, che offre accesso ad alta velocità a Internet, soluzioni di rete intelligente e servizi innovativi, con l'obiettivo di migliorare la vita dei suoi abitanti.

<u>In Finneria</u>:

Oulu Innovation Village, a Oulu, è un'area di innovazione tecnologica e imprenditoriale, che promuove la collaborazione e lo sviluppo di soluzioni intelligenti;

Lyseparken, è un quartiere a Stavanger che integra soluzioni intelligenti per l'illuminazione pubblica, la gestione dei rifiuti e la mobilità sostenibile;

Brütten, a Zurigo, è un comune svizzero che ha adottato tecnologie ecologiche per l'approvvigionamento energetico, come l'energia solare e la cogenerazione (*Fig. 7*).

<u>In Svizzera</u>:

Tänikon Smart Village, sfrutta tecniche di agricoltura intelligente, sistemi di energia rinnovabile e soluzioni di mobilità elettrica per creare una comunità rurale sostenibile e all'avanguardia in termini di innovazione.

<u>In Estonia</u>:

Lõunakeskuse Smart Village, a Tartu, è incentrato sull'uso di soluzioni digitali e sostenibili per migliorare la vita quotidiana della comunità e rendere il villaggio un luogo moderno e ben organizzato.

<u>In Norvegia</u>:

Gjesdal Smart Village utilizza tecnologie digitali per migliorare la gestione dei rifiuti, la mobilità e coinvolgere attivamente i cittadini nella vita del villaggio.

<u>In Macedonia del Nord</u>:

Belasica Smart Village ha come obiettivo principale l'utilizzo delle tecnologie digitali per promuovere il turismo sostenibile e lo sviluppo economico nella regione (D'Orazio et al., 2015).

Fig. I.3.4 | Schlierbach, Austria ©Mapcarta, 2023.

Fig. I.3.5 | Freiburg Vauban, Germania ©Visit Freiburg, 2023.

Fig. I.3.6 | Österbymo Smart Village, Svezia ©Fishing Cabin Rental, 2023.

Fig. I.3.7 | Tänikon Smart Village, Svizzera ©Agroscope, 2023.

Questi sono solo alcuni degli *Smart Villages* presenti in Europa che hanno dimostrato successo nell'applicazione delle tecnologie digitali e delle soluzioni sostenibili per lo sviluppo delle comunità rurali grazie ai fondi provenienti dall'Europa (Ratti C. et al., 2016). È importante sottolineare che questi esempi rappresentano solo una selezione ristretta delle numerose iniziative in continua evoluzione che stanno trasformando radicalmente le aree rurali in Europa. Ogni *Smart Village* è unico e risponde alle specifiche esigenze e sfide della sua comunità e del suo territorio, contribuendo a creare un futuro più sostenibile e prospero per le zone rurali del continente.

All'interno del vasto contesto degli *Smart Villages*, numerosi sono i progetti europei che hanno affrontato questa tematica, i più importanti, tuttavia sono, *Smart Rural* 21, *Smart Rural* 27 e il progetto pilota "Villaggi

eco-sociali intelligenti". In particolare, i progetti *Smart Rural* 21 e *Smart Rural* 27 rappresentano due iniziative finanziate dalla Commissione Europea con l'obiettivo comune di promuovere lo sviluppo di villaggi intelligenti in Europa in casi pilota selezionati. Di seguito è fornita una descrizione formale di entrambi i progetti:

Smart Rural 21[7], progetto della durata di due anni e mezzo (2018-2020), coinvolse 21 villaggi pilota in 12 Stati membri dell'Unione Europea. La sua missione era sviluppare e implementare strategie mirate alla transizione di questi villaggi verso una forma di comunità intelligente. Gli obiettivi specifici comprendevano l'innovazione sociale, la *governance* collaborativa, lo sviluppo economico locale e la sostenibilità ambientale.

Smart Rural 27[8], progetto triennale esteso dal 2020 al 2023, coinvolse 27 Stati membri dell'Unione Europea. L'obiettivo principale era assistere gli Stati membri nella definizione di quadri di riferimento per la creazione di supporti infrastrutturali a sostegno dei villaggi intelligenti. Gli ambiti focali comprendevano politiche e strategie per lo sviluppo rurale, capacità e competenze, finanziamenti e investimenti.

Entrambi i progetti hanno evidenziato che essere un villaggio intelligente implica l'utilizzo di tecnologie digitali e l'innovazione per affrontare le sfide locali, migliorando la qualità della vita dei residenti. Questi villaggi si basano su approcci innovativi e sostenibili, incorporando soluzioni tecnologiche per ottimizzare servizi, infrastrutture e risorse, al fine di creare comunità più resilienti e orientate al futuro.

Parallelamente, vale la pena menzionare anche il progetto pilota *Smart eco-social villages*[9] riassunto esecutivo redatto dalla Direzione Generale per l'Agricoltura e lo Sviluppo Rurale della Commissione Europea che identifica le migliori pratiche per supportare lo sviluppo futuro di strategie di sviluppo. Il progetto si articola in quattro temi principali, analizzando opportunità e sfide nelle aree rurali dell'Unione Europea, definendo *Smart Villages*, illustrando esempi di *best practices* e indagando sullo sviluppo di una strategia per un villaggio intelligente. Il documento sottolinea che gli *Smart Villages* sono comunità rurali che utilizzano soluzioni innovative per migliorare la loro resilienza, sfruttando le tecnologie digitali e promuovendo la partecipazione attiva della comunità locale; così come l'importanza della *governance* efficace, del coinvolgimento attivo della comunità, della semplicità delle strategie e della cooperazione con altre comunità e attori rurali e urbani. Inoltre, si enfatizza la necessità di semplificare e razionalizzare le procedure di accesso al finanziamento pubblico, supportare gli investimenti a piccola scala e promuovere la cooperazione tra comunità. Il progetto sottolinea l'importanza di fornire supporto a livello europeo, nazionale e regionale per lo sviluppo degli *Smart Villages*, con particolare attenzione alle aree rurali meno favorite. Le tre lezioni principali fornite riguardano l'ampia varietà di iniziative nelle aree rurali dell'UE, l'importanza della partecipazione cittadina e la necessità di un quadro di supporto flessibile e mirato a diversi livelli di governo. Offre, dunque, una panoramica dettagliata fornendo le prime linee guida importanti per il supporto e lo sviluppo di tali iniziative nelle aree rurali dell'Unione Europea. Analizzando le sfide e opportunità affrontate dalle aree rurali dell'UE, il progetto pilota sottolinea la necessità di politiche di finanziamento pubblico semplificate e di supporto a diversi livelli di governo per favorire lo sviluppo degli *Smart Villages* nell'Unione Europea (Rossi et al., 2017).

Una roadmap che può essere adattata alle specifiche esigenze dell'area di studio. L'implementazione potrebbe costituire un passo significativo verso una politica coerente e integrata, capace di affrontare le sfide territoriali in maniera più efficace. In appendice, verrà posta l'attenzione su altrettanti casi studio specifici degli *Smart Villages* in diverse nazioni europee (Caragliu et al., 2019).

Ogni scheda, così come lo è stato per l'analisi dei contesti extraeuropei, fornirà un'ampia panoramica delle caratteristiche e degli obiettivi di ciascun progetto, mettendo in evidenza i risultati raggiunti e le soluzioni innovati-

[7] Smart Rural 21. (2021). Smart Rural 21 project: Supporting rural communities in becoming smarter. Retrieved December 16, 2024, from https://www.smartrural21.eu/

[8] Smart Rural 27. (2023). Smart Rural 27 project: Supporting rural areas in becoming smarter. Retrieved December 16, 2024, from https://www.smartrural27.eu/

[9] European Commission. (2019). Smart eco-social villages pilot project. Retrieved December 16, 2024, from https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cmef/rural-areas/smart-eco-social-villages-pilot-project_en

ve adottate. Tali esempi rappresentano solo una selezione delle molteplici iniziative che stanno contribuendo a trasformare le aree rurali europee, ma forniranno un quadro completo delle potenzialità e dei benefici dell'implementazione di tale pratica nel contesto europeo. La comprensione approfondita dei casi studio risulta essere cruciale per cogliere appieno il loro impatto positivo Europa.

Ciascun progetto racconta una storia unica di resilienza, innovazione e coinvolgimento della comunità, dimostrando come la digitalizzazione e la sostenibilità possano contribuire a un futuro più prospero queste aree rurali europee. Attraverso questi esempi, si spera di ispirare altre comunità a intraprendere iniziative simili e di fornire spunti preziosi per il progresso tecnologico e sociale. L'analisi presenta nuove opportunità e sfide per le zone rurali europee, dove l'implementazione di soluzioni intelligenti e innovative si profila come un auspicio condiviso.

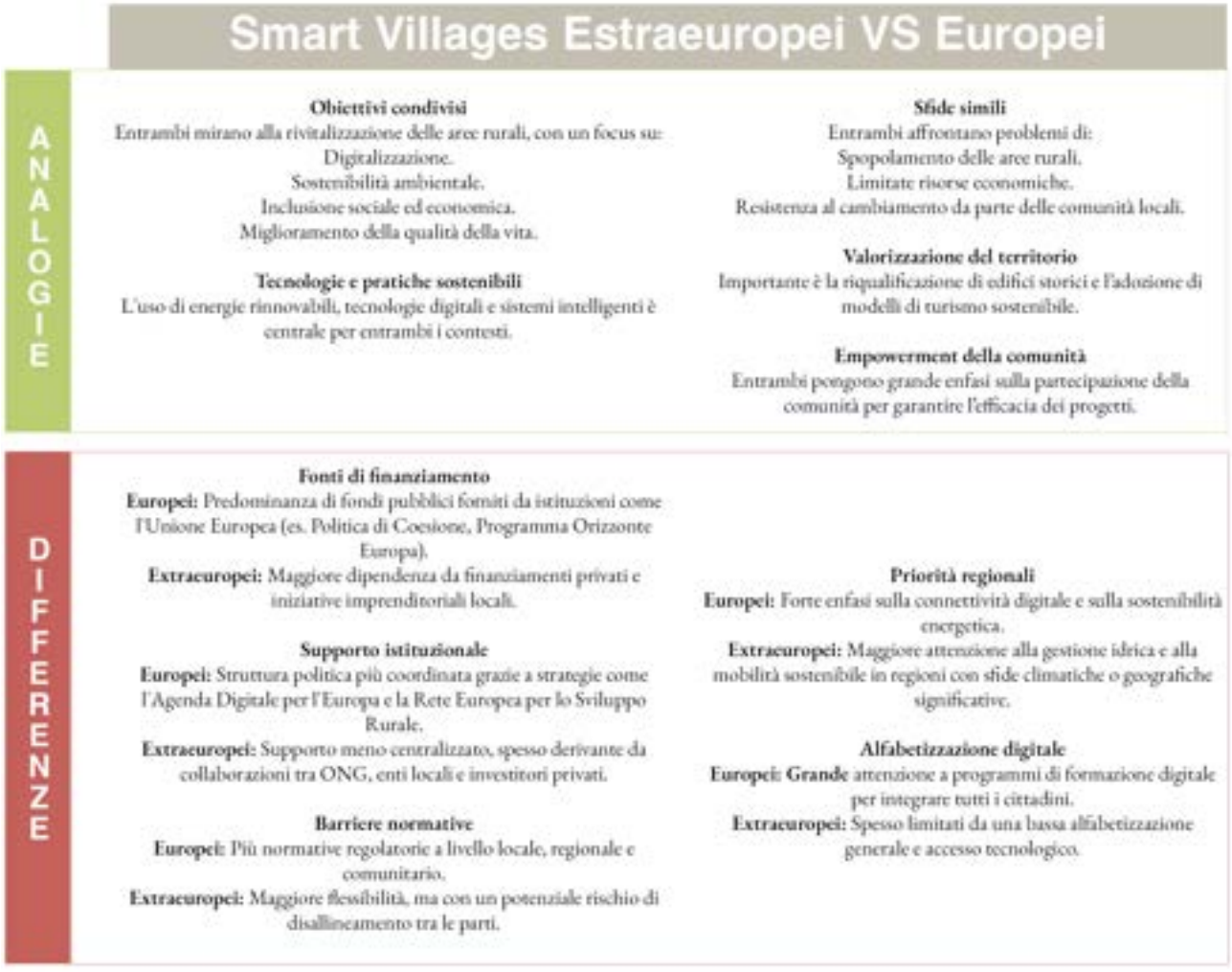


Fig. I.3.8 | Differenze tra Smart Villages Extraeuropei e Smart Villages Europei; ©Luisa Lombardo, 2024.

La tabella presenta un'analisi comparativa tra Smart Villages extraeuropei e europei, focalizzandosi sulle tecnologie utilizzate, i fondi disponibili, le sfide, le barriere normative e il supporto istituzionale. Da un lato, le esperienze extraeuropee tendono a utilizzare soluzioni tecnologiche più avanzate, spesso in contesti con minori vincoli normativi, ma con sfide legate all'accesso ai fondi e alla scarsità di supporto istituzionale strutturato. Dall'altro, i Smart Villages europei beneficiano di un quadro normativo consolidato e di un forte supporto istituzionale, ma si trovano a dover affrontare barriere normative più rigide e un maggiore focus sulla sostenibilità ambientale e inclusività sociale. La tabella evidenzia come le diverse politiche e risorse disponibili influenzino l'adozione di tecnologie e lo sviluppo di progetti in entrambi i contesti, offrendo uno spunto per l'adattamento e l'integrazione di buone pratiche.

Fig. I.3.9 | Freiburg Vauban, Germania ©Visit Freiburg, 2023.

Fig. I.3.10 | Baia dei Gelsomini © SR27, 2023.

Fig. I.3.11 | Ostana, Italia, SR21 © Silvia Pasquetto, 2017.

Fig. I.3.12 | Gaiba © SR27, 2023.

I.3.1 Strategie metodologiche usate per la mappatura dei casi studio

Le buone pratiche di rigenerazione e valorizzazione dei piccoli centri rappresentano una manifestazione della metamorfosi che sta coinvolgendo i territori interni, offrendo esperienze virtuose che agiscono e trasformano gli spazi, le comunità e le relazioni che intercorrono tra di essi. Questi elementi costituiscono un momento indispensabile per la ricerca, considerando le buone pratiche come dispositivi che, nella prospettiva di *Michel Foucault*, rappresentano una formazione che ha una funzione strategica dominante in un dato momento storico. Si tratta di uno studio razionale e concertata degli elementi di forza, finalizzata a svilupparli in una direzione specifica, bloccarli o stabilizzarli.

Con la consapevolezza dell'urgenza di affrontare le sfide della marginalità fisica, sociale ed economica di una parte estesa del territorio nazionale, queso paragrafo presenta la metodologia affrontata per l'analisi e la scelta dei casi studio. Riconoscendo il potenziale significativo di tali territori per la rinascita delle località, si propone una riflessione sulla possibilità che le esperienze mappate e analizzate fungano da dispositivi per rileggere i territori in chiave sostenibile, considerandoli come laboratori di futuro.

Gli esiti di quanto proposto costituiscono una componente utile per la redazione delle linee guida finali per la rinascita dei territori interni. Dopo la costruzione del metodo analitico, ogni esperienza è stata esaminata in base alla metodologia adottata, alla distinzione tra interventi derivanti dalle politiche pubbliche e quelli promossi da iniziative private, al suo carattere innovativo, alla capacità di generare economie e promuovere la riattivazione dei luoghi, e alla scala di applicazione, distinguendo tra casi a scala urbana e casi a scala territoriale.

L'elaborazione di schedature è stata essenziale per creare un quadro conoscitivo di buone pratiche di recupero e valorizzazione dei piccoli centri.
La sezione di approfondimento analitico, risultato dell'analisi qualitativa, offre un'ulteriore comprensione delle specificità di ciascun caso, contribuendo a estrarre riferimenti validi per definire possibili approcci futuri al tema della rigenerazione e valorizzazione dei piccoli centri. La catalogazione delle schede, nel dettaglio, ha implicato un'indagine sulle esperienze, condotta attraverso la ricerca in diverse fonti (bibliografiche e sitografiche), successivamente mappate. Per ciascun caso studiato, sono state elaborate schede di approfondimento. L'obiettivo prefissato è la creazione di un'ipotesi di un vademecum di buone pratiche, che, pur non essendo esaustivo, rappresenti una prima proposta di soluzioni innovative implementabili nel tempo. Tale proposta mira a far emergere le pratiche virtuose di recupero e valorizzazione dei piccoli centri, prestando particolare attenzione alle realtà che operano su sistemi territoriali.
Ai fini della catalogazione e mappatura, è stata condotta una preventiva verifica dei requisiti per ogni pratica. Tale verifica ha coinvolto l'analisi di numerosi altri casi studio, anche non direttamente correlati al territorio in questione o rappresentativi di dinamiche troppo distanti. Il primo livello di verifica è stato definito tramite i "criteri di ammissibilità", composti da tre componenti, i quali devono essere soddisfatti dalle pratiche esaminate. Un secondo livello, definito dai "criteri di qualificazione", comprende quattro categorie di intervento, e l'esperienza deve rispondere a almeno una di esse.

Dopo la verifica dei requisiti di primo e secondo livello, sono state esaminate circa cento pratiche provenienti da tutto il mondo. Queste esperienze sono state selezionate mediante un approccio qualitativo, considerando il massimo grado di rispondenza alle quattro tipologie di azioni individuate come criteri di qualificazione. L'obiettivo è costruire un quadro di buone pratiche esteso su tutto il territorio nazionale, per il caso italiano, ma anche mappare ulteriori esperienze significative, taltolta anche non riscontrabili nel suolo italiano per fare altrettanto tesoro di esperienze riproducibili.

Nel dettaglio:
A. Criteri di Ammissibilità (Requisiti di Primo Livello)

- **A.1 Definizione di SMART Village** - Il comune coinvolto deve aver attuato politiche *smart* che lo inseriscano pienamente nella concezione di villaggio *smart*. Questo riconoscimento deriva dalla capacità del comune di sviluppare e implementare soluzioni innovative, che contribuiscano alla promozione del territorio e alla sua valorizzazione in un'ottica di sostenibilità e innovazione. Tale identificazione è il risultato della capacità del Comune di sviluppare e promuovere iniziative che si distinguono per la loro innovazione, contribuendo alla notorietà del territorio attraverso una diffusione efficace su vari canali mediatici e tramite la copertura della stampa locale.
- **A.2 Dimensione Demografica** - Il comune può essere un piccolo centro abitato, oppure una parte periferica di un grande centro urbano o di una città. In alternativa, può includere piccoli ambiti territoriali, come periferie o quartieri, caratterizzati da una dimensione contenuta e da specificità locali che ne giustifichino l'inserimento nella strategia *smart*. Il comune coinvolto è preferibile qualora abbia una popolazione non superiore a 10.000 abitanti, tenendo conto del limite di 5.000 abitanti come riferimento per la definizione di "piccolo comune" secondo il disegno di legge approvato dalla Camera dei Deputati il 18 aprile 2007. Questa definizione si estende fino a 10.000 abitanti, considerato come soglia demografica minima per la costituzione delle unioni di comuni, in particolare nel contesto nazionale e nelle regioni del Meridione, dove i centri fino a 10.000 abitanti sono considerati aree fragili (Polci, 2015).
- **A.3 Dimensione Geografica** - l comune coinvolto è preferibile che rientri nella classificazione di area interna, come definito nel "Documento Strategia Nazionale per le Aree Interne: definizioni, obiettivi, strumenti e *governance*, Accordo 2014-2020" (DPS, 2014). Il comune può trovarsi lungo la costa, in collina o in montagna, ma deve presentare svantaggi in termini di servizi o opportunità legate all'applicazione di strategie *smart*. Questi limiti possono includere carenze infrastrutturali, economiche o gestionali che richiedano interventi mirati per promuovere uno sviluppo sostenibile e integrato tale da essere un comune intermedio, periferico o ultraperiferico.

B. Criteri di Qualificazione (Requisiti di Secondo Livello)
Dopo la schedatura e la mappatura dei casi, è stata effettuata una selezione tra quelli considerati tra i più rappresentativi. Questi sono stati sottoposti a successivi approfondimenti e a una schedatura di secondo livello per definire soprattutto gli impatti e i valori prodotti, al fine di generare modelli replicabili in contesti differenti. Per la selezione di questi casi esemplari, sono state scelte le buone pratiche per ogni tipologia di azione progettuale, al fine di costruire un quadro di riferimento di casi virtuosi, pari a otto pratiche. La rispondenza a almeno una delle seguenti categorie di intervento costituisce il requisito di secondo livello per la qualificazione:

- **B.1 Azioni con finalità turistiche, immobiliari e volte all'ospitalità;**
- **B.2 Azioni con finalità produttive e/o commerciali;**
- **B.3 Azioni con finalità artistiche, culturali e formative;**
- **B.4 Azioni con finalità sociali e cooperative;**
- **B.5 Azioni di tecnologia e digitalizzazione;**
- **B.6 Azioni di recupero e valorizzazione del patrimonio materiale e immateriale;**
- **B.7 Azioni di governance efficace;**
- **B.8 Azioni di miglioramento dell'accessibilità.**

In aggiunta, la fase conclusiva di analisi riguarda lo studio dei casi internazionali elaborata durante le attività come *Visiting Researcher Student* presso la Real Academia de Belles Artes de San Carlos de Valencia e l'Universitat Politecnica di Valencia. Questa fase si è sviluppata con lo stesso approccio adottato per i casi italiani, utilizzando la schede precedentemente descritta (adattandola dove necessario), ma analizzando un numero più contenuto di pratiche (una esperienza per ogni categoria).

[1]Il termine "Piccolo Comune", come definito nel contesto amministrativo attuale e fondato sulla LN approvata dalla Camera dei Deputati il 18 aprile 2007, si riferisce a un comune caratterizzato da una popolazione inferiore o uguale a 5.000 abitanti, classificandolo così come "piccolo". Tale definizione rappresenta il 72% dei comuni italiani. La legislazione pertinente, riportata nella legge del 7 aprile 2014, articoli 5 e 6, dispone in merito alle città metropolitane, alle province, alle unioni e alle fusioni di comuni. In particolare, l'articolo 1 comma 107 stabilisce il limite demografico per la costituzione delle unioni e delle convenzioni di cui all'articolo è fissato a 10.000 abitanti.
[2]La classificazione demografica, in conformità con le disposizioni del Testo Unico delle Leggi sull'Ordinamento degli Enti Locali, approvato con Decreto Legislativo nell'agosto del 2000 (n. 267), delinea le categorie demografiche residenti. Nel Rapporto sull'Italia del "disagio insediativo", le realtà fragili vengono descritte come un fenomeno che coinvolge territori marginali o marginalizzati di piccole dimensioni. Questa situazione si estende a territori di dimensioni più ampie, causando diverse criticità, particolarmente legate alla popolazione residente. Non solo i piccoli comuni sono a rischio di disagio insediativo, ma oltre la metà dei comuni italiani presenta una popolazione inferiore a 10.000 abitanti.

Tutti i casi studio individuati seguendo la metodologia delineata sono documentati e dettagliati all'interno del "Case Study Booklet", consultabile nel documento allegato all'elaborato di tesi, l'*Allegato 1*. La presente raccolta fornisce un quadro esauriente delle esperienze esaminate, offrendo una visione approfondita delle strategie, delle pratiche e degli impatti associati a ciascun caso studio. L'accesso al "Case Study Booklet" permette ai lettori, studiosi e interessati di esaminare in modo dettagliato e sistematico le diverse iniziative considerate, fornendo un supporto documentato e approfondito alla comprensione dei risultati e delle conclusioni presenti nel contesto dell'elaborato di tesi. La consultazione dell'Allegato 1 rappresenta, pertanto, una risorsa indispensabile per approfondire e contestualizzare ulteriormente le argomentazioni e le analisi proposte nel corso della ricerca.

Fig. I.3.1.1 | Schema metodologico della selezione dei casi studio relativi agli Smart Villages © Luisa Lombardo, 2023.

I.4 L'Italia verso lo sviluppo di Smart Villages

In un mondo sempre più omogeneo e globalizzato, i Paesi dimenticati soprattutto dell'entroterra italiano, spesso etichettati come "borghi", rappresentano una parte preziosa e autentica del nostro patrimonio culturale e sociale. Tuttavia, è giunto il momento di abbandonare l'etichetta riduttiva di "borgo" e abbracciare il termine più inclusivo e significativo di "paese". I paesi italiani sono molto più di semplici agglomerati urbani; sono il cuore pulsante della nostra identità regionale e nazionale. Questi luoghi, che possono essere densamente popolati o sospesi in una quiete apparente, sotto il sole o avvolti nella nebbia, rivelano una varietà di storie, tradizioni e stili di vita che riflettono la ricchezza della nostra nazione. Sono comunità di persone che si conoscono, si aiutano reciprocamente e costruiscono il tessuto sociale che forma la base della nostra società (Agenzia per la Coesione territoriale, 2021).

Mentre il "borgo" riguarda la dimensione urbanistica e definisce più il contenitore che il contenuto, concentrandosi sulla struttura fisica e architettonica[1]. Il termine "paese", invece, rimanda alla comunità, all'insieme di relazioni e funzioni che includono le persone, le loro attività, i loro sentimenti di appartenenza e di vicinato. La vicinanza è un valore essenziale, la base della coesione sociale, uno spazio in cui gestire i conflitti e costruire un riconoscimento comune e reciproco che influenza la sfera della dignità e della responsabilità. Nel paese, gli individui non sono soli e si intrecciano sempre con la dimensione comunitaria. I comportamenti individuali diventano pratiche collettive, e l'interesse personale si sposa con l'interesse collettivo. Questo equilibrio dinamico è ciò che rende i paesi così unici e vitali. La parola "paese" va oltre la semplice descrizione geografica e rappresenta, infatti, un concetto più profondo, basato sulla comunità, sulle relazioni umane e sulla responsabilità reciproca. La vicinanza, sia geografica che sociale, è un valore fondamentale che contribuisce alla coesione sociale creando un tessuto sociale unico (Barbera et al., 2022).

Purtroppo, la retorica del "piccolo è bello" spesso si riduce a un'idealizzazione superficiale. I paesi non sono solo luoghi pittoreschi per una fuga romantica, per le vacanze estive o per il riposo dal caos delle città. Al contrario, sono spazi di lavoro, di innovazione e di grande resilienza. Nelle comunità rurali, l'agricoltura, l'allevamento e l'artigianato svolgono ruoli cruciali nell'economia e nella cultura locali, frutto, molto spesso, di tradizioni tramandate di generazione in generazione. Le filiere corte, la gestione collettiva dei beni comuni e le microimprese cooperative rappresentano modelli economici sostenibili che possono contribuire a mantenere in vita queste aree. Tuttavia, per rendere giustizia a queste comunità, è necessario abbandonare l'approccio uniforme alla politica e ai servizi. La diversità delle regioni italiane richiede politiche differenziate, che tengano conto delle specifiche peculiarità locali, della vocazione territoriale.

Non è possibile che i paesi siano trasformati in luoghi di svago per il fine settimana o che siano semplici destinazioni turistiche; le classiche mete "mordi e fuggi". La loro autenticità e vitalità dipendono da un impegno costante per preservare e promuovere ciò che li rende speciali. Abbiamo bisogno di riscoprire e valorizzare le risorse uniche delle aree interne italiane, ab-

[1]Il libro "Contro i borghi", curato da Filippo Barbera, Antonio De Rossi e Domenico Cersosimo e pubblicato da Donzelli, attraverso una serie di saggi concisi, mira a smontare l'immagine romantica e idealizzata dei borghi italiani, ponendo in risalto l'importanza delle comunità rurali e delle aree interne all'interno delle politiche territoriali. Gli autori evidenziano la necessità di ridefinire il concetto di "borgo", mettendo in risalto l'importanza di concentrarsi sulle esigenze quotidiane e sulla vita delle comunità locali piuttosto che sulla semplice attrattività turistica. Si critica l'abuso del termine "borgo" nell'immaginario comune, il quale rischia di svuotare di significato le realtà rurali, relegandole a semplici paesaggi da cartolina. Inoltre, vengono affrontate le implicazioni delle politiche pubbliche, sottolineando la necessità di una visione politica volta alla rigenerazione sociale ed economica delle aree interne. Si ribadisce l'importanza di investire in infrastrutture e servizi essenziali per garantire una vita dignitosa nei paesi, anziché concentrarsi esclusivamente sul turismo. Infine, viene proposto il concetto di "movimento lento" come approccio per comprendere le relazioni tra i paesi e il contesto circostante, suggerendo un ritorno alle relazioni territoriali tradizionali e alla valorizzazione delle risorse locali.
Tratto da "Contro i borghi, per i paesi" Altreconomia, di Luca Martinelli — 13 Luglio 2022

bracciando un nuovo modo di vivere, produrre e consumare che vada oltre il "piccoloborghismo"[2]. La strada per salvare i paesi è chiara: investire nell'agricoltura, nell'allevamento e nell'artigianato, promuovere la solidarietà e la cooperazione, e adottare politiche mirate alle specifiche esigenze delle comunità locali, nonchè concentrarsi sul patrimonio architettonico più autentico e, il più delle volte, meglio conservato, ma ben lontano degli standard di vita contemporanei. Solo attraverso questo approccio differenziato e inclusivo è possibile proteggere e valorizzare i paesi, preservando la loro autenticità e vitalità e contribuendo a costruire un futuro più sostenibile e inclusivo per tutti (Presidenza del Consiglio dei Ministri, 2020).

Le sfide affrontate dalle piccole comunità in Italia sono evidenti quando si considerano i limiti imposti dalle dimensioni ridotte, un ostacolo significativo rispetto alle esigenze su larga scala richieste dall'economia moderna[3]. Questa situazione spesso mette in svantaggio le aree rurali a favore dei grandi centri più organizzati, in grado di fornire servizi di qualità superiore. Una disparità particolarmente evidente si riscontra nei territori dell'entroterra, soprattutto lungo la fascia appenninica, i quali, a differenza dei valichi alpini di collegamento con gli stati settentrionali, hanno subito uno sviluppo infrastrutturale inferiore e, di conseguenza, sono stati oggetto di un progressivo abbandono.

I. 4.1 I centri minori italiani

Ammontano a poco più di 300, con una popolazione totale di circa 6.000 abitanti, certificati dalla Soprintendenza delle Belle Arti come patrimonio architettonico e naturale. Secondo i dati del 2020 presentati da Coldiretti, il 16% degli italiani, ovvero 9,8 milioni di abitanti, risiede in questi affascinanti paesi che costituiscono il 54% del territorio nazionale, raggiungendo addirittura il 70% in alcune regioni[3].

Oltre a quelli già celebri a livello internazionale, molti altri centri italiani hanno intrapreso recentemente programmi di riqualificazione e rilancio, non solo per scopi turistici. Panorami mozzafiato, valorizzazione delle tradizioni, produzioni enogastronomiche locali e ambienti naturali incontaminati caratterizzano questi borghi, rendendoli sempre più attraenti non solo per i turisti, ma anche per coloro che desiderano acquistare una seconda casa o trasferirsi permanentemente.

Attualmente, i borghi rappresentano una parte significativa dell'assetto amministrativo italiano, con 5.521 borghi che costituiscono il 69,85% dei 7.904 comuni del paese. La distribuzione geografica indica una concentrazione maggiore nelle aree interne della Penisola, lungo la dorsale appenninica e l'arco alpino. Dal secondo dopoguerra, le aree interne hanno subito un progressivo spopolamento, perdendo 900.000 abitanti. La popolazione dei piccoli comuni ha registrato una diminuzione media annua dello 0,2% dal 1981 al 2020. Questo declino ha coinciso con flussi migratori di giovani e l'aumento dell'età media degli abitanti, con il 17,6% della popolazione oltre i 65 anni.

A livello culturale, i borghi rappresentano una parte significativa del patrimonio italiano, includendo il 31,1% di luoghi e beni e il 32,8% dei musei. L'impatto sulla cultura enogastronomica è altrettanto rilevante, con il 90% dei prodotti DOP, IGP e *slow-food* provenienti dai piccoli comuni (ISTAT, 2023).

Per identificare i borghi più belli, associazioni come "Borghi più belli d'Italia" e "Borghi Autentici d'Italia" svolgono un ruolo cruciale. Oltre a creare reti e condividere progetti di valorizzazione, queste associazioni lavorano per promuovere queste realtà a livello nazionale e internazionale, favorendo lo sviluppo del turismo e dell'economia locale, oltre a garantire la tutela del patrimonio artistico e culturale.

Esplorare questi gioielli sparsi per il territorio italiano è possibile attraverso i siti web delle associazioni, suddivisi per regione. Inoltre, il programma televisivo "Borgo dei borghi", trasmesso dalla Rai, annualmente classifica i borghi più belli d'Italia, consentendo al pubblico di votare il proprio prefe-

[2] L'articolo di Letizia Bindi, pubblicato il 1 marzo 2021, esplora le dinamiche di marginalizzazione, spopolamento e rigenerazione delle aree rurali e montane in Italia, con un focus sulle comunità patrimoniali e le loro pratiche culturali. Prendendo spunto dal lavoro di Ernesto de Martino e dal canto popolare lucano "Canzone della Rabata", l'autrice riflette sul ruolo storico dei contadini come soggetti politici, sottolineando come la frammentazione delle sinistre abbia contribuito all'abbandono delle aree interne e alla loro folklorizzazione dagli anni Sessanta in poi. Il processo di marginalizzazione si è intrecciato con le politiche nazionali ed europee che, pur incentivando l'agricoltura industrializzata e intensiva, hanno spesso ignorato le specificità locali. Tuttavia, dagli anni Novanta, un cambiamento di paradigma ha portato alla valorizzazione di pratiche agricole sostenibili, biologiche e legate al territorio, incentivando il ripopolamento e la rinascita delle comunità rurali. Questo movimento, però, è condizionato dalle crisi economiche globali, dai cambiamenti climatici e dall'impatto delle economie neoliberiste.
L'autrice evidenzia la necessità di una prospettiva multidisciplinare per comprendere i fenomeni di spopolamento e le esperienze di rigenerazione delle aree marginali, includendo studi etnografici, analisi delle mobilità e una riflessione critica sui rapporti tra natura e cultura nell'Antropocene. In particolare, si sottolinea l'importanza di ridefinire le rappresentazioni delle comunità montane e rurali, evidenziando la loro capacità di resilienza e accoglienza.
Fonte: Bindi, L. (2021). *Oltre il 'piccoloborghismo'. Comunità patrimoniali e rigenerazione delle aree fragili.*

[3] I borghi italiani costituiscono una parte significativa del paesaggio amministrativo del paese, con un totale di 5.521 comuni, che rappresentano il 69,85% dei 7.904 comuni totali. Questi borghi ospitano una popolazione complessiva di circa 10 milioni di residenti, equivalente al 17% della popolazione nazionale, e occupano il 54% del territorio italiano. Concentrati soprattutto nelle aree interne della Penisola, sono distribuiti lungo l'appennino e l'arco alpino. Piemonte e Lombardia contengono quasi il 50% del totale, con 2.089 borghi su 5.521.Regioni come Abruzzo, Calabria, Molise, Sardegna, Valle d'Aosta e Trentino-Alto Adige vedono i piccoli comuni costituire tra l'80 e il 90% del territorio, mentre in Puglia, Toscana ed Emilia-Romagna rappresentano meno del 50% del totale regionale. Nel corso degli anni, le aree interne hanno subito un progressivo spopolamento, perdendo 900.000 abitanti dal secondo dopoguerra. Questo declino ha interessato in particolare i piccoli comuni lungo l'appennino e l'arco alpino. La popolazione montana, che nel 1951 rappresentava il 41,8% del totale, oggi si attesta intorno al 26%. Tra il 1981 e il 2020, la popolazione dei piccoli comuni ha avuto una variazione media annua del -0,2%, passando da 10.758.231 a 9.961.955 abitanti.Questo calo demografico ha portato ad un'invecchiamento della popolazione, con il 17,6% degli abitanti che ha più di 65 anni.

Inoltre, il 16,6% ha un'età compresa tra i 40 e i 65 anni, mentre solo il 15,7% ha meno di 40 anni. Questi dati sollevano questioni significative sull'identificazione del segmento di popolazione giovane. Culturalmente, i borghi rappresentano una parte importante del panorama nazionale, con il 31,1% dei luoghi e dei beni culturali e il 32,8% dei musei italiani. Contribuiscono in modo significativo anche alla cultura enogastronomica e alla produzione di prodotti locali, con il 90% dei prodotti DOP e IGP provenienti dai piccoli comuni. Tuttavia, non tutti i borghi sono uguali, e molti piccoli comuni, specialmente quelli al di sotto dei 5.000 abitanti, affrontano sfide infrastrutturali e culturali. Questi includono carenze infrastrutturali, scarsa formazione e consapevolezza culturale della popolazione locale e difficoltà nell'accesso all'innovazione, come la connessione a banda larga. Per affrontare queste sfide e attuare interventi mirati, è essenziale analizzare i dati demografici dei borghi in relazione ai contesti regionali. Molte di queste comunità richiedono attenzione e sostegno per garantire la loro vitalità e prosperità nel contesto moderno.
Dabimus. (2024). Home. Recuperato il 16 dicembre 2024, da https://www.dabimus.com/

Fig. I.4.1.1 | Fontainemore, Valle d'Aosta - Borgo Alpino ©Borghi più belli d'Italia, 2024.

Fig. I.4.1.2 | Pomponesco, Una piccola contea dietro l'argine - Lombardia ©Borghi più belli d'Italia, 2024.

Fig. I.4.1.3 | Campiglia Marittima, Un inno con tutte le sfumature sul pentagramma della natura - Toscana ©Borghi più belli d'Italia, 2024.

Fig. I.4.1.4 | Sepino, All'incrocio dei tratturi - Molise ©Borghi più belli d'Italia, 2024.

rito. I comuni che rispondono ai criteri possono candidarsi per ottenere il prestigioso riconoscimento di "borgo più bello d'Italia" (Bacilieri C., 2021). Questi pittoreschi centri abitati possono essere distinti in tre categorie principali: borghi costieri, collinari e montani, ognuno con le proprie peculiarità e atmosfere distintive.

I *borghi costieri* sono ubicati in prossimità del mare, godendo di una posizione privilegiata che offre non solo bellezze naturali mozzafiato ma anche un accesso diretto alle risorse marine. Questi borghi sono spesso favoriti dalla presenza di servizi più ampi e dalla vicinanza a centri urbani, rendendoli attraenti per i visitatori. Tuttavia, alcuni di essi potrebbero trovarsi in uno stato di abbandono, privi di un'adeguata amministrazione che ne promuova lo sviluppo e la valorizzazione.

I *borghi collinari*, al contrario, occupano una posizione intermedia tra le valli e le cime delle colline, spesso circondati da vigneti e paesaggi pittoreschi. Questi borghi possono godere di una condizione più accessibile rispetto a quelli montani, facilitando il raggiungimento dei servizi essenziali. La loro posizione strategica tra le alture contribuisce a una qualità di vita mediamente migliore, anche se possono comunque essere soggetti a sfide legate alla gestione delle risorse locali.

Infine, i *borghi montani* sono i *joyaux* nascosti dell'Italia, con la loro collocazione spesso arroccata su cime impervie. Sebbene affrontino sfide come l'accessibilità limitata e un clima più rigido, questi borghi conservano un'autenticità e un fascino unici. La loro architettura tradizionale, spesso intatta da recenti interventi di recupero, testimonia di una storia e di una cultura che resistono al passare del tempo. L'isolamento geografico rende questi paesi meno popolati, ma allo stesso tempo contribuisce a preservare la loro autenticità e bellezza intrinseca.

I.4.2 Abbandono e spopolamento

Trattando del tema dell'abbandono, i piccoli centri minori in Italia rappresentano una realtà allarmante e diffusa su tutto il territorio nazionale, richiedendo una seria attenzione. Secondo i dati forniti dall'ISTAT, sono ben 5.627 i piccoli comuni a rischio, di cui 3.532 con meno di 2.000 abitanti e 2.105 con meno di 1.000 abitanti, segnalando uno stato avanzato di abbandono. Tra questi, 197 borghi sono completamente disabitati. Queste comunità, spesso costituite da un insieme di case che si sviluppa attorno a una piazza centrale, come quella della chiesa madre o della fontana, si trovano in luoghi remoti e difficilmente raggiungibili, spesso lontani dalle principali vie di comunicazione. La maggior parte di essi trova il loro "habitat ideale" nelle regioni dell'Appennino e dell'entroterra (ISTAT, 2023).

Questi, più di semplici aggregati di case, sono custodi di identità locali di inestimabile valore. Attraverso la testimonianza del loro stile di vita, del modo di costruire e di abitare, offrono una finestra sul passato e sulla relazione delle comunità con il paesaggio circostante. L'abbandono dei piccoli comuni in Italia, tuttavia, ha radici profonde, risalenti al periodo post-seconda guerra mondiale. Durante il boom economico, si è verificato un massiccio spopolamento dovuto alla migrazione delle persone verso le città in cerca di lavoro e benessere, causando anche l'abbandono dell'agricoltura a favore dell'industrializzazione. Non viene meno a questa analisi l'abbandono di tantissimi giovani che, per mancanza di occasioni lavorative, hanno lasciato il Sud Italia e popolato il Nord e i territori oltralpe in cerca di condizioni lavorative migliori. In aggiunta, alcuni paesi risultano totalmente abbandonati o perchè chiudono le scuole (Milani, R. (Regista). (2024). Un mondo a parte [Film]. Produzione: Medusa) o per fenomeni come eventi calamitosi che li hanno resi non abitabili.

La Calabria detiene il primato con 20 paesi abbandonati, seguita dalla Toscana e dal Piemonte che emergono come le seconde regioni italiane con il maggior numero di borghi abbandonati, totalizzando rispettivamente 19 ciascuno. Subito dopo troviamo l'Abruzzo e la Liguria con 17 borghi disabitati, seguiti dalla Sardegna con 16. È degno di nota il fatto che tutte le

[1] La normativa europea a supporto degli *Smart Villages* si inserisce in una più ampia strategia europea volta a promuovere la sostenibilità, la competitività e l'inclusione sociale nelle aree rurali dell'Unione Europea.
Una delle iniziative principali a livello europeo è la "Politica di coesione dell'Unione Europea", che comprende diverse azioni e programmi mirati allo sviluppo economico e sociale delle regioni dell'UE, comprese le aree rurali. In particolare, il Fondo Europeo di Sviluppo Regionale (FESR) e il Fondo Sociale Europeo (FSE) sono due strumenti fondamentali per il finanziamento di progetti volti a promuovere l'innovazione, l'occupazione, l'istruzione e lo sviluppo sostenibile nelle aree rurali.
Alcune delle principali iniziative europee a sostegno degli *Smart Villages* includono:
La strategia dell'UE per le aree rurali: La Commissione Europea ha sviluppato una strategia specifica per le aree rurali al fine di favorire l'innovazione, l'occupazione e la qualità della vita nelle comunità rurali. Questa strategia promuove l'uso delle tecnologie digitali e l'accesso a internet ad alta velocità per le aree rurali.
Iniziativa sulla **banda larga per l'Europa**: L'UE si è impegnata a fornire una connessione a internet ad alta velocità e a copertura totale a tutte le aree dell'UE entro il 2025. Ciò include anche le zone rurali, contribuendo a ridurre il divario digitale tra aree urbane e rurali.
Programma Horizon Europe: Questo programma di ricerca e innovazione dell'UE sostiene progetti che promuovono l'innovazione tecnologica e lo sviluppo sostenibile nelle aree rurali. Il programma offre finanziamenti a progetti che sviluppano soluzioni innovative per le sfide delle comunità rurali.
Programma LIFE: Questo programma finanzia progetti che contribuiscono alla protezione dell'ambiente e alla promozione della transizione verso un'economia sostenibile nelle aree rurali.
Programma Leader: Questo programma offre sostegno finanziario per iniziative di sviluppo rurale e locale, spesso basate su partenariati tra le comunità locali e le autorità pubbliche. I progetti coprono diverse aree tematiche, come l'agricoltura sostenibile, il turismo rurale, la valorizzazione del patrimonio culturale e la promozione dell'occupazione.
Iniziativa WiFi4EU: Questo programma offre finanziamenti per l'installazione di punti di accesso Wi-Fi pubblico gratuiti in spazi pubblici, comprese le aree rurali, al fine di migliorare l'accesso a internet per i cittadini.
Council of the European Union. (2023, November 20). A long-term vision for the EU's rural areas: Council approves conclusions. European Union. https://europa.eu/!YY84Cq

Fig. I.4.1.5 | Cisternino, L'abbagliante kasbah della valle d'Itria - Puglia ©Borghi più belli d'Italia, 2024.

regioni, comprese quelle con economie robuste presentino almeno un paese abbandonato. Tuttavia, grazie alla loro economia solida, le Alpi non hanno sperimentato il fenomeno dello spopolamento con la stessa intensità degli Appennini. La Valle d'Aosta, il Trentino Alto Adige, il Veneto e il Friuli Venezia Giulia, con un numero limitato di paesi abbandonati, testimoniano chiaramente questa differenza.

Il numero di città abbandonate sul territorio italiano (ISTAT, 2023) supera il migliaio, raggiungendo circa 6.000 se si includono i piccoli agglomerati abitativi e gli alpeggi.

L'Italia sta assistendo a una diminuzione della sua popolazione. Nel solo 2018, gli abitanti italiani sono diminuiti di 124.427 unità, portando la popolazione complessiva al di sotto dei 60 milioni. Se non fosse per la componente straniera, dal 2011 al 2019, la popolazione italiana avrebbe registrato una diminuzione di oltre 800 mila unità. Il fenomeno dello spopolamento è dunque un fatto conclamato.

Questi dati, che si legano all'invecchiamento della popolazione e alla diminuzione delle nascite, sono ancor più preoccupanti per il 2020 a causa dell'aumento della mortalità provocato dal Covid-19 (ISTAT, 2023).

Va notato che tali statistiche non si applicano uniformemente sull'intero territorio nazionale. Le tendenze demografiche variano considerevolmente: la popolazione cresce nelle regioni settentrionali e centrali, mentre diminuisce nel mezzogiorno. Inoltre, si osserva una crescita nelle aree urbane e lungo le coste, a differenza della diminuzione nei piccoli paesi e nelle zone interne.

L'Istituto Nazionale di Statistica, Istat, fornisce un quadro dettagliato di queste dinamiche attraverso il Censimento permanente della popolazione e delle abitazioni. A differenza dei censimenti decennali precedenti al 2011, l'attuale metodologia si basa su un campione significativo coinvolto annualmente, fornendo informazioni sempre aggiornate su vari aspetti della vita italiana. I dati relativi al 2018 e al 2019 pubblicati da Istat, tra cui uno specifico focus sui Borghi più belli d'Italia, forniscono ulteriori dettagli. Dai 307 comuni insigniti di questo titolo, emergono tendenze demografiche interessanti e rappresentative delle dinamiche di spopolamento, soprattutto nei piccoli comuni delle aree interne.

Tra il 1951 e il 2019, solo 12 di questi comuni hanno registrato una crescita costante della popolazione, mentre 83 sono stati caratterizzati da uno spopolamento continuo. La componente straniera si è rivelata cruciale nel mitigare la perdita demografica, con un incremento notevole dopo il 2001. Tuttavia, l'analisi evidenzia che i borghi con meno di diecimila abitanti, in particolare quelli sotto i tremila, sono i più colpiti, con una diminuzione di quasi 300 mila persone rispetto al 1951.

Nonostante la perdita complessiva di popolazione nei borghi tra il 1951 e il 2019 sia di circa 185 mila unità, a partire dal 2001 si è osservato un'inversione di tendenza grazie all'immigrazione. Questo fenomeno si è intensificato dopo il 2011, coinvolgendo principalmente i comuni di medie dimensioni (5-15 mila abitanti).

Attualmente, la componente straniera rappresenta il 7% della popolazione dei 307 borghi più belli d'Italia, un notevole aumento rispetto al 2,2% registrato nel 2001. Questa popolazione straniera è giovane e mostra un tasso di fecondità più elevato rispetto alla media italiana, suggerendo un potenziale contributo al rallentamento dello spopolamento in Italia.

Le strategie per contrastare questo fenomeno includono iniziative di ripopolamento dei borghi, sfruttando le loro potenzialità turistiche e investendo in infrastrutture digitali per consentire lavori da remoto. La pandemia e la crisi ecologica potrebbero favorire uno stile di vita più sostenibile nei borghi. Tuttavia, è essenziale un impegno politico ed economico deciso per garantire il successo di tali iniziative. La Strategia Nazionale per lo Sviluppo delle Aree Interne (SNAI), lanciata nel 2012, rappresenta un esempio di iniziativa significativa, seppur con alcune criticità, per contrastare lo spopolamento e rivitalizzare i territori. La sua ripresa potrebbe contribuire in modo significativo a mitigare il fenomeno su scala nazionale.

I.4.3 Per una nuova vita nei centri minori italiani

In Italia, l'idea di creare villaggi intelligenti[1] nei piccoli borghi, o meglio ancora, paesi sta guadagnando sempre più terreno come soluzione innovativa per ravvivare queste aree rurali, mitigare l'abbandono e promuovere uno sviluppo sostenibile e abbracciare le moderne tecnologie digitali. Negli ultimi anni, il turismo alla scoperta dei borghi italiani ha registrato notevoli numeri di visitatori, suscitando un crescente interesse e successo.

I villaggi intelligenti in Italia possono distinguersi per diverse peculiarità. In primo luogo, promuovono l'adozione della connettività ad alta velocità, le soluzioni *IoT - Internet of Things -* e le applicazioni digitali, al fine di migliorare i servizi e stimolare l'innovazione. Inoltre, pongono una forte enfasi sulla sostenibilità, valorizzando le risorse locali e promuovendo l'efficienza energetica, l'utilizzo di energie rinnovabili, una gestione sostenibile del territorio e pratiche agricole eco-compatibili.

Infine, si impegnano a preservare e valorizzare il patrimonio culturale, promuovendo la tutela delle tradizioni, delle produzioni locali e dei luoghi di interesse storico e artistico e l'architettura locale.

I benefici che i villaggi intelligenti apportano alle comunità rurali sono molteplici. In primo luogo, stimolano lo sviluppo economico, attirando nuove imprese e investimenti e promuovendo la crescita sostenibile delle attività locali attraverso l'innovazione e l'imprenditorialità. Inoltre, l'adozione di tecnologie digitali e soluzioni innovative migliora l'accesso ai servizi essenziali, come la sanità, l'istruzione, il trasporto e la sicurezza, contribuendo a una migliore qualità della vita per i residenti. Dal punto di vista ambientale, favoriscono pratiche sostenibili e una transizione verso un'economia a basse emissioni di carbonio, utilizzando energie rinnovabili, gestendo in modo efficiente le risorse e promuovendo l'agricoltura sostenibile. Inoltre, promuovono la preservazione dell'identità culturale delle comunità rurali, valorizzando le tradizioni, la cultura e il patrimonio locale, e incentivando un turismo sostenibile e la valorizzazione delle produzioni tipiche del territorio, in ultimo, cercano di migliorare anche l'accessibilità dei luoghi. Rappresentano un modello innovativo per lo sviluppo rurale in Italia. L'idea, nel futuro prossimo, è che gli *Smart Villages* diventino sempre più diffusi in Italia, seguendo l'esempio di quanto già avvenuto in altri paesi europei ed extraeuropei, ma prendendo spunto anche da parecchi casi italiani già intrapresi. Attualmente, esistono diverse tipologie di progetti di recupero e valorizzazione per paesi abbandonati o in via di abbandono, ognuno con finalità specifiche, in particolare:

- **turistico-immobiliare:** è la forma più popolare di recupero, poiché assicura un rapido ritorno degli investimenti. Il focus principale è la trasformazione degli edifici esistenti, anche in stato di vetustà, in strutture ricettive o abitazioni private. Ne sono un esempio gli alberghi diffusi, con la *hall* in un edificio centrale del paese e le stanze per l'accoglienza dei turisti nelle case circostanti, rappresentano il modello più comune e replicato;
- **produttivo:** dalle antiche manifatture alle moderne *start-up*, dai centri di ricerca universitari alle aziende agricole. Un esempio è Solomeo, nella provincia di Perugia, trasformato in un centro per la produzione di cachemire;
- **sociale:** promuove le comunità locali, sviluppa servizi innovativi e costruisce reti solidali. Il coinvolgimento attivo di diversi attori è essenziale per favorire la crescita economica, sociale e culturale della comunità. Anche se non esistono esempi puri di *Social Housing*, si stanno sperimentando forme di *Co-Housing* in luoghi come il borgo Torri Superiore in Liguria;
- **creativo:** si concentra su arte, cultura e intrattenimento. Le attività vanno dall'insediamento di comunità artistiche all'organizzazione di *workshop*, *stage*, produzioni artistiche ed eventi culturali. L'interazione con artisti e personalità della cultura contribuisce a creare una rete organizzativa e spazi per ospitare eventi;

[1] Una delle prime realtà italiane a trasformarsi in *Smart Village* è stato il comune di Sellia, in provincia di Catanzaro. Grazie ai fondi ricevuti dal PNRR, sono in corso di adozione diverse soluzioni *smart*. Tra queste, c'è l'acquisto di veicoli elettrici: scuolabus e mezzi per le pulizie stradali. Panchine intelligenti consentiranno la ricarica di smartphone e monopattini. Una rete di sensori segnalerà il malfunzionamento dei lampioni, il livello di riempimento dei cestini dell'immondizia ed eventuali perdite nella rete idrica. Inoltre, le nuove tecnologie di monitoraggio ambientale permetteranno di mitigare i rischi di dissesto idrogeologico e incendio. E poi non manca l'attenzione alla salute. In paese è già attiva una "health station", una stazione medica che misura diversi parametri vitali dei cittadini quali temperatura corporea, peso, pressione sanguigna e saturazione dell'ossigeno. Santa Flora, in provincia di Grosseto, dal 2020 si propone come "Smart Working Village". Dopo avere installato la banda larga in paese, l'amministrazione comunale intende ripopolare il comune ospitando chi lavora a distanza. Oltre a infrastrutture digitali dalle elevate prestazioni, il progetto prevede incentivi sugli affitti, così da attirare nella località il popolo degli *smart worker*. Sulla stessa lunghezza d'onda è il comune di Monte San Martino, in provincia di Macerata. Anche la piccola realtà marchigiana è sulla via della trasformazione digitale. Il suo percorso prevede attività di formazione e affiancamento rivolte alla comunità locale e il lancio di servizi di co-working e accoglienza pensati per chi vuole lavorare a distanza. Sull'Appennino genovese, l'Unione dei comuni delle Valli Stura, Orba e Leira punta invece sulla mobilità sostenibile. A beneficiarne sarà la popolazione dei comuni di Mele, Campo Ligure, Masone, Rossiglione e Tiglieto. Grazie ai fondi europei, è stato infatti istituito un servizio gratuito di bus a chiamata che collega le Valli del SOL a Genova.

Fig. I.4.1.6 | San Marino, un mondo unico al mondo ©Borghi più belli d'Italia, 2024.

- **opera d'arte:** sfrutta la creatività come volano per lo sviluppo dei centri minori per valorizzare il paesaggio naturalistico e il patrimonio architettonico per attrarre nuovi turisti in modo alternativo.

In Italia, sono state realizzate numerose pratiche di successo tali da poter essere definite prime occasioni di "villaggi intelligenti", ma per promuovere ulteriormente l'adozione queste pratiche di sviluppo è essenziale implementare politiche di sostegno e implementare ulteriori iniziative che coinvolgono più strategie. Ciò può avvenire attraverso finanziamenti dedicati, come fondi europei, nazionali e regionali[1] per progetti di innovazione e sviluppo rurale, ma anche attraverso forme di collaborazione tra privati, iniziative di cittadini e collaborazione con università ed enti di ricerca. Risulta cruciale favorire la collaborazione tra Enti per realizzare con successo i progetti dei villaggi intelligenti, combinando competenze, risorse e conoscenze. Coinvolgere attivamente la comunità locale nel processo decisionale e nella gestione dei villaggi intelligenti stimola la sostenibilità delle iniziative e crea un senso di appartenenza e partecipazione attiva.

La pandemia da Covid-19[2] ha reso necessario riconsiderare i modelli di sviluppo tradizionali, aprendo la strada a nuove possibilità e soluzioni. Questa crisi ha messo in evidenza l'importanza di un approccio oculato e graduale alla transizione, con una rinnovata consapevolezza delle sfide innovative che attendono le aree interne italiane. La necessità di elaborare nuove idee e paradigmi di sviluppo è emersa in modo più evidente, portando alla luce i problemi causati dall'eccessiva urbanizzazione e mobilità, che hanno contribuito alla diffusione del virus. Questa consapevolezza ha spinto a conside-

Fig. I.4.1.7 | Borgo costiero di Vernazza, Liguria. © Si Viaggia, MartinM303 2019.

Fig. I.4.1.8 | Borgo collinare di Brisighello, Emilia Romagna. © Travel The Wom, 2019.

Fig. I.4. 1. 9 | Borgo montano Brindisi di Montagna, Basilicata. © Si Viaggia, Michele Luongo, 2019.

[2]L'articolo del 27 settembre 2020 discute il fenomeno turistico che ha caratterizzato l'estate dello stesso anno, evidenziando un aumento significativo delle visite ai borghi italiani. La ragione principale di questo incremento risiede nel desiderio di evitare sovraffollamenti in destinazioni tradizionali e di scoprire prodotti e tradizioni meno conosciuti, una tendenza amplificata dall'emergenza COVID-19. Secondo un'analisi della Coldiretti, due italiani su tre hanno scelto di trascorrere le loro vacanze estive nei borghi italiani. Tale scelta è stata motivata anche dal crollo del 72% degli arrivi turistici nei paesi dell'Europa meridionale nel primo semestre dell'anno, come riportato dall'Organizzazione Mondiale del Turismo. Il turismo di prossimità ha registrato un aumento significativo, con un quarto degli italiani che ha optato per destinazioni vicino casa, all'interno della propria regione di residenza. Questo fenomeno è stato favorito dalla presenza diffusa di piccoli comuni, che offrono un ricco patrimonio naturale, paesaggistico, culturale e artistico. Le visite ai borghi sono state trainate principalmente dalla ricerca di prodotti enogastronomici tipici del territorio. I souvenir preferiti dagli italiani durante l'estate 2020 sono stati i formaggi, seguiti da salumi, vino e olio extravergine d'oliva. La ricerca di prodotti tipici è diventata un elemento imprescindibile delle vacanze in Italia, considerato il ruolo di leadership del paese nel turismo enogastronomico, con una vasta gamma di specialità e vini a indicazione geografica riconosciuti a livello comunitario.
L'ospitalità nei piccoli centri è stata garantita principalmente dalle strutture agrituristiche, che offrono un ambiente familiare, posti letto limitati e ampi spazi all'aperto, ideali per rispettare le misure di sicurezza anti-COVID. Durante il mese di settembre, si è stimato un elevato numero di presenze in queste strutture, che consentono ai turisti di godere della buona cucina e di partecipare ad attività autunnali tradizionali. Il presidente di Coldiretti, Ettore Prandini, ha sottolineato l'importanza del turismo nei piccoli borghi come risorsa strategica per il rilancio economico e occupazionale del paese dopo la crisi sanitaria. *Tratto da ANSA, [ultimo aggiornamento: 29 dicembre 2021]*

rare soluzioni di decentralizzazione sociale e urbanistica come risposta alla crisi attuale, ma anche come opportunità di sviluppo sicuro e sostenibile, ne sono un esempio i primi villaggi nati per soddisfare il bisogno di *smart working*. Inoltre, la questione dello spopolamento dei piccoli comuni e della desertificazione delle aree decentrate è divenuta ancora più pressante. In questo contesto, gli *Smart Villages* si propongono come un modello innovativo di sviluppo rurale; nel 2023, in Italia, ci sono tantissimi primi esempi *smart* in tutte le regioni italiane, la maggior parte dei quali si trova all'interno del grande stivale, solo pochi, pochissimi esempi nel Sud Italia e nelle isole, e presentano una varietà di progetti e iniziative. Le tematiche maggiormente trattate includono:

- **miglioramento dell'efficienza energetica degli edifici:** L'utilizzo di tecnologie avanzate per ridurre il consumo di energia e promuovere fonti energetiche sostenibili;
- **mobilità sostenibile:** L'adozione di soluzioni di trasporto ecologiche come veicoli elettrici o biciclette condivise;
- **gestione intelligente dei rifiuti:** L'implementazione di sistemi di raccolta dei rifiuti più efficieWnti e il riciclaggio;
- **sicurezza:** L'utilizzo di sistemi di videosorveglianza e altre tecnologie per garantire la sicurezza della comunità;
- **promozione dell'agricoltura sostenibile:** L'uso di tecnologie agricole avanzate per migliorare la produttività e la sostenibilità dell'agricoltura locale;
- **valorizzazione del patrimonio culturale:** La preservazione delle tradizioni culturali e storiche attraverso iniziative di promozione turistica e culturale.

Inoltre, offrono una serie di benefici alle comunità rurali, tra cui:

- **miglioramento della qualità della vita:** L'accesso a servizi avanzati e sostenibili, dalla sanità all'istruzione, migliora la vita dei residenti;
- **promozione della sostenibilità:** L'adozione di energie rinnovabili e pratiche agricole eco-sostenibili contribuisce alla tutela dell'ambiente;
- **tecnologia e innovazione:** L'implementazione di tecnologie digitali stimola l'innovazione economica e sociale;
- **attrazione di nuovi investimenti:** Gli *Smart Villages* diventano attraenti per nuovi investimenti, promuovendo la crescita economica;
- **creazione di nuovi posti di lavoro:** I progetti di *Smart Villages* spesso generano grandi, importanti ed essenziali opportunità di lavoro locali.

Nel panorama globale, come già ampiamente esplorato nei paragrafi precedenti, si assiste sempre più a una crescente importanza dei servizi e all'adozione di approcci digitali in svariati settori. Tuttavia, in territorio italiano, questa transizione risulta spesso rallentata da un patrimonio architettonico di inestimabile valore e pregio. Non è, infatti, semplice introdurre tecnologie e digitalizzazione in contesti ben conservati. L'Italia, con la sua ricca storia e le sue caratteristiche architettoniche uniche, si trova di fronte a sfide particolari nell'implementazione rapida di nuove tecnologie.

La lentezza nell'adozione di sistemi tecnologici può essere attribuita alla necessità di conciliare le innovazioni con contesti architettonici intrisi di storia e tradizione, in cui le peculiarità sono non solo evidenti, ma spesso vincolanti soprattutto per quanto concerne il patrimonio architettonico. L'innesto di soluzioni digitali in ambienti caratterizzati da antiche fabbriche edilizie può rivelarsi un processo complesso, laborioso e assai difficile.

Le sfide emergono non solo a livello di adattamento tecnologico, ma anche a causa delle stringenti regolamentazioni volte a preservare il patrimonio culturale del Paese. La salvaguardia di edifici storici, monumenti e siti archeologici impone limiti e richiede un approccio attento e rispettoso, consapevole e compatibile. Di conseguenza, mentre nel resto del mondo l'adozione di tecnologie avanzate è spesso rapida e senza intoppi, in Italia si assiste a un bilanciamento più ponderato tra l'eredità del passato e le esigenze del presente.

Se da un lato questo approccio riflette la volontà di preservare il patri-

monio culturale, dall'altro può causare una certa lentezza nell'adozione di nuove soluzioni digitali, anche quando queste potrebbero apportare significativi miglioramenti in termini di efficienza e servizi. Utilizzando tecnologie avanzate e l'approccio partecipativo della comunità, tuttavia, è possibile migliorare la qualità della vita nelle aree rurali, stimolare la crescita economica e promuovere la sostenibilità. L'adozione diffusa di questi modelli dipenderà dalla presenza di politiche di sostegno a livello nazionale e regionale e dalla collaborazione tra settori pubblici e privati per attuare con successo le iniziative degli *Smart Villages*.

Anche per il caso italiano, all'interno degli *Smart Villages* europei, sono state redatte schede riepilogative dei casi studio analizzati e che hanno adottato processi virtuosi di rigenerazione e rivitalizzazione urbana tali da essere definiti *Smart Villages* o "Villaggi Intelligenti".

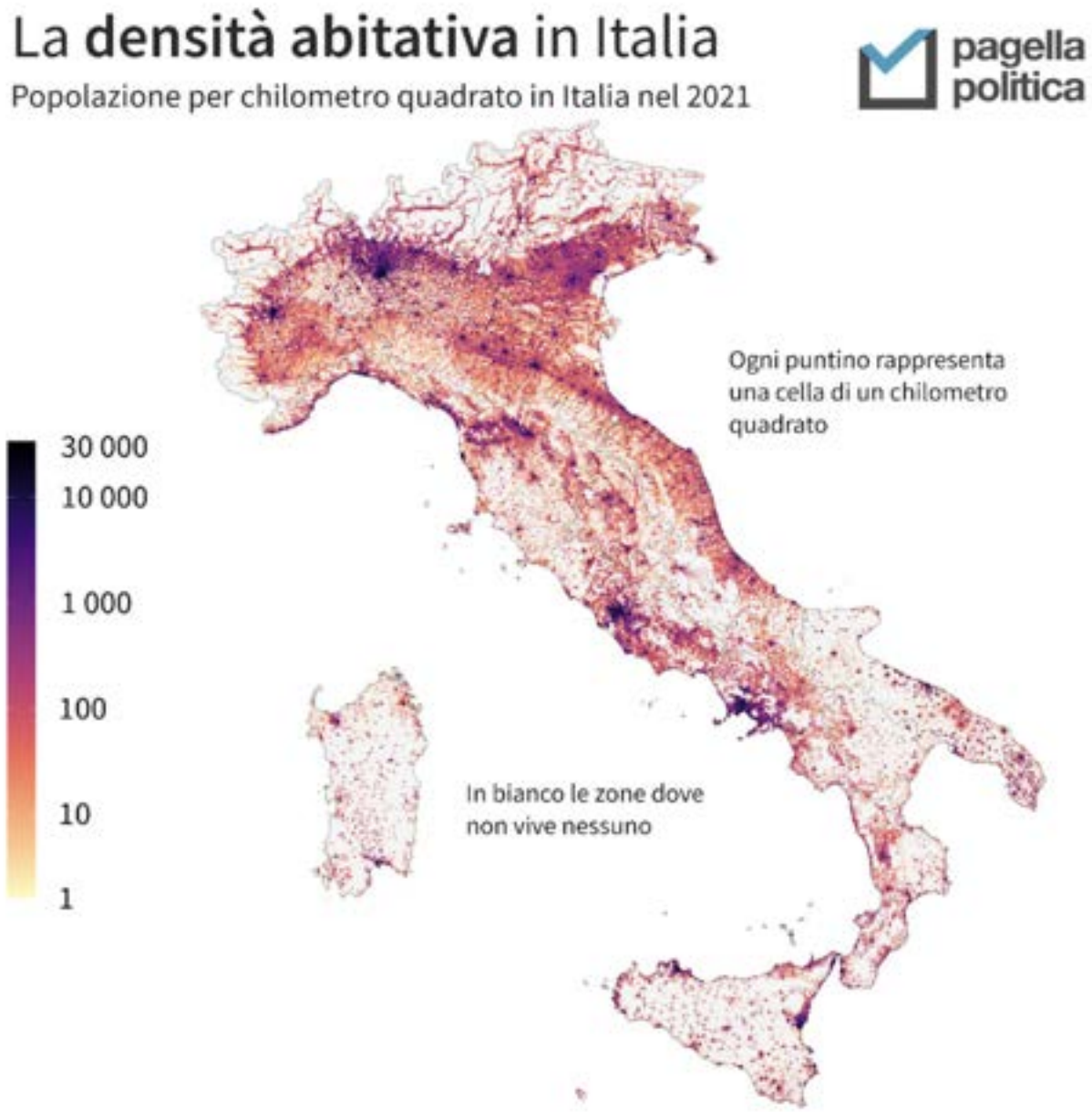


Fig. I.4.1.10 | La densità abitativa in Italia ©Pagella Politica, 2021.

Fig. I.4.1.11 | Santa Fiora, uno dei primi smart village d'italia attraverso l'implementazione dello smart working © Si Viaggia 2022.

BORGHI ABBANDONATI IN ITALIA

NORD

LOMBARDIA
Assiano
Borgo del Conte
Castel Liteggio
Corsonno
Daslie
Monteviasco
Mulini di Piero
Pagliari
Vaiano Valle

LIGURIA
Balestrino
Bussana Vecchia
Brugosecco
Cà di Ferré
Canale di Maniglia
Case Velxe
Costa di Soglio
Cravarezza
Caselle
Lavazzuoli
Flettino

PIEMONTE
Avi
Reneuzzi
Antrona
Aramolo
Brusaschetto Basso
Casoni di Vegni
Connio
Ferrazza
Leri Cavour
Narbona
Semermorello
Torrione

EMILIA ROMAGNA
Bastia
Durazzo
Borgata La Cà
Castel d'Alfero
Cerreto di Saludecio
Sant'Antonio
San Paolo in Alpe
Lavacchielli
Pastorale

TRENTINO ALTO ADIGE
Borgo Carrera
Curon Vecchio
Irone

FRIULI VENEZIA GIULIA
Palcoda
Moggessa di Qua
Moggessa di Là
Pozzis

VALLE D'AOSTA
Barmaz
Fornet

VENETO
California
Fumegai
Orsetti
Poveglia

CENTRO

TOSCANA
Rocca San Silvestro
Bacchionero
Buriano
Bugnano
Canneto
Castiglioncello
Fabbriche di Careggine
Formentara
Toiano
Vetriceto
Roveraia

LAZIO
Anturi
Monterano
Celleno
Civita di Bagnoregio
Camerata
Chia
Faleria Antica
Montecoccioli
Norchia
Reopasto
Stazzano

MOLISE
Pesche
Ripalimosani
Rocchetta Alta

ABRUZZO
Altovia
Albe Vecchia
Buonanotte
Faroone
Frattura
Frunti (Solignano)
Gessopalena
Lafuro
Lecce nei Marsi
Marfese
Serra
Stivigliano
Tavolero
Torre di Sperone
Valle Pezzota
Valle Piola

MARCHE
Castelnuovo di Auditore
Gesso
Tavernelle
Vasci
Cossinino da Piedi
Elcito

UMBRIA
Biselli
Marzana
Scoppio
Umbriano

SUD

CALABRIA
Africo
Avena
Amendolea
Brancaleone
Campana
Acerenthia
Carello
Ceella Vecchia
Campana
Casalinuovo di Africo
Cavallerizzo di Cerzeto
Fantino
Roghudi
Saguccio
Ferruzzano
Gumeno
Laino Castello
Nicastrello
Papaglionti
Pentedattilo
Perlupo

CAMPANIA
Apice
Roscigno
Aquilonia
Sacco
San Severino di Centola
Castelpoto
Corza della Campania
Croce
Fondola
Melito Irpino
Romagnano al Monte
Sarbo
Tocco vecchio
Senerchia
San Felice

PUGLIA
Balsignano
Monterugo
Rione dei Fossi
Roca Nuova
San Nicola

BASILICATA
Craco
Campomaggiore Vecchia
Allanello Vecchio
Taccone
Brienza
Rabatana

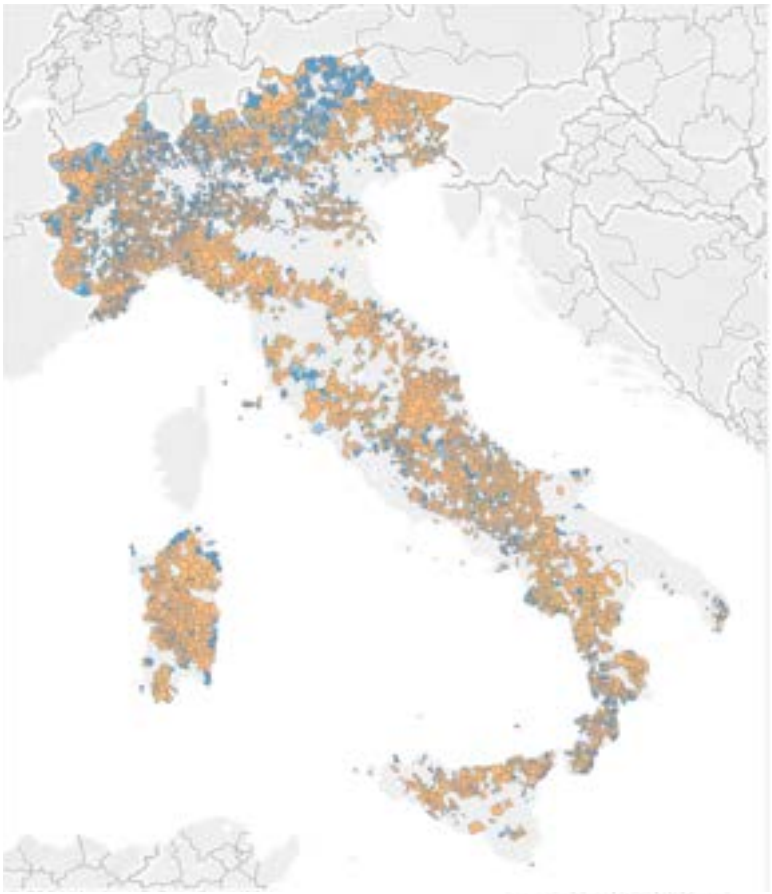
ISOLE

SICILIA
Bazzina Alta
Borgo Baccarato
Borgo Borzellino
Borgo Schirò
Cunziria
Gibellina
Massa San Nicola
Poggioreale
Scurati

SARDEGNA
Gairo Vecchia
Naracauli
Orbai
Osini
Villaggio Asproni
Trofalias

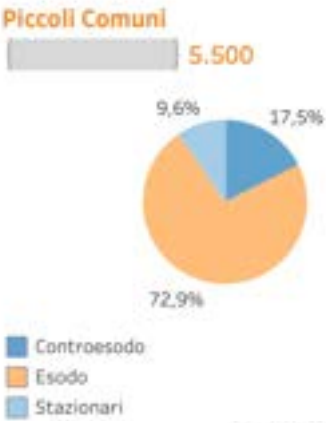
Fig. I.4.1.12 | Elenco di alcuni dei borghi italiani fantasma. © Luisa Lombardo, 2023.

ATLANTE DEI PICCOLI COMUNI



Complessivamente sono 5.500 i Piccoli Comuni, il 69% dei comuni italiani, nei quali si contano 10.068.213 residenti, il 17% della popolazione nazionale. Le regioni con il più alto numero di piccoli Comuni sono Piemonte (1.046) e Lombardia (1.043). La maggior parte dei piccoli Comuni ha una popolazione compresa 1.001 e 3.000 abitanti (il 45,8%), mentre i Comuni con popolazione sotto i 1.000 abitanti sono il 33,6% del totale.

Fonte: elaborazione Anci su dati ISTAT e dell'Agenzia per la Coesione Territoriale



	Numero di Piccoli Comuni	Popolazione legale 2011
PIEMONTE	1.046	1.305.774
VALLE D'AOSTA	73	92.704
LOMBARDIA	1.043	2.097.223
TRENTINO-ALTO ADIGE	256	455.679
VENETO	289	747.112
FRIULI-VENEZIA GIULIA	151	278.111
LIGURIA	182	246.230
EMILIA-ROMAGNA	135	362.755
TOSCANA	119	289.667
UMBRIA	61	134.402
MARCHE	160	320.231
LAZIO	254	461.258
ABRUZZO	250	356.367
MOLISE	125	153.962
CAMPANIA	335	693.521
PUGLIA	84	215.437
BASILICATA	99	191.044
CALABRIA	322	646.343
SICILIA	202	493.766
SARDEGNA	314	526.627
Totale	**5.500**	**10.068.213**

Zona altimetrica

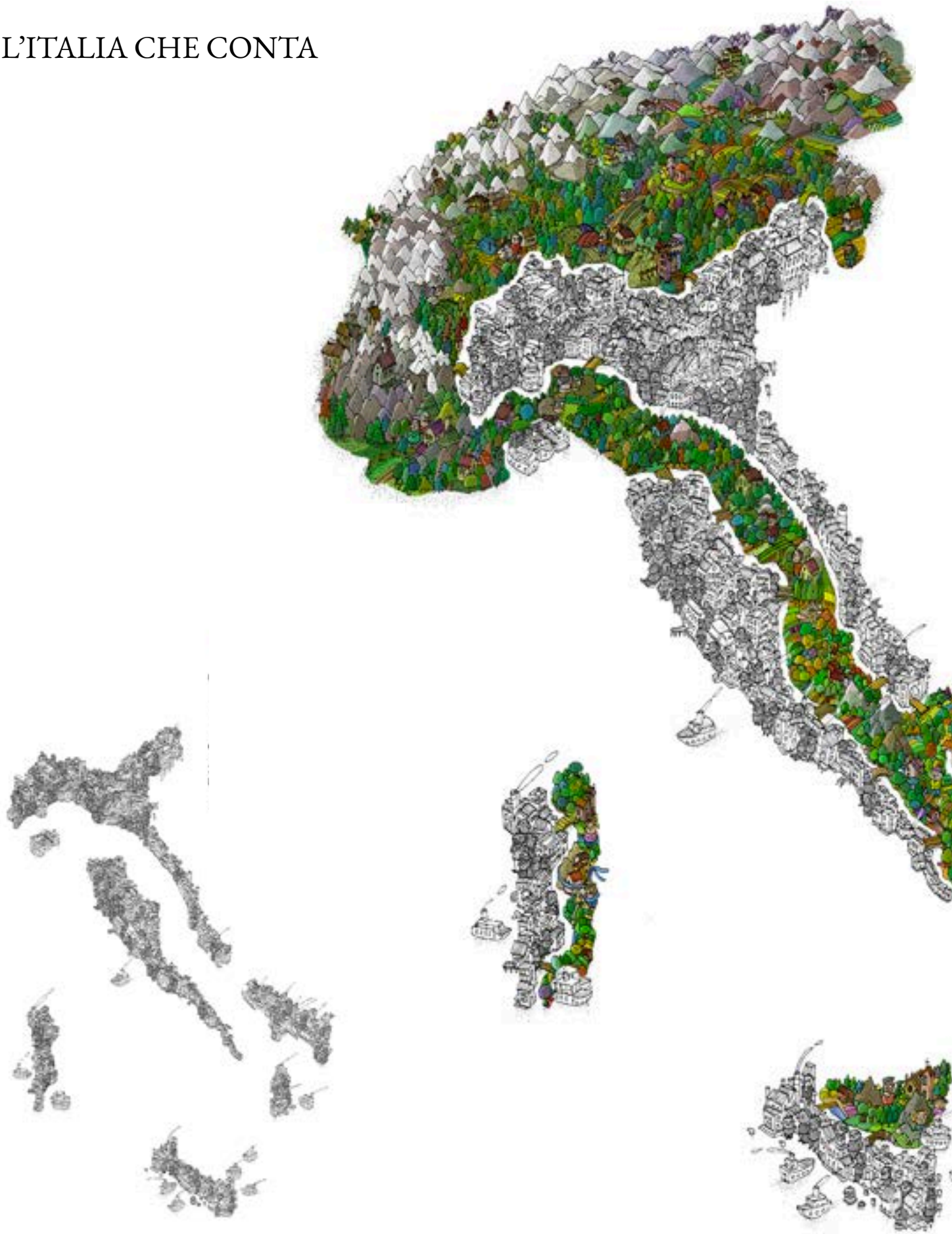
	Montagna interna	Montagna litoranea	Collina interna	Collina litoranea	Pianura	Totale
Controesodo	16,0%	8,5%	15,5%	24,4%	22,7%	**17,5%**
Esodo	75,2%	85,4%	75,7%	65,5%	64,4%	**72,9%**
Stazionari	8,8%	6,1%	8,8%	10,1%	12,9%	**9,6%**
Totale	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Aree interne

	Piccoli Comuni in Area Interna		
	No	Si	Totale
Controesodo	26,2%	12,2%	**17,5%**
Esodo	60,6%	80,4%	**72,9%**
Stazionari	13,3%	7,3%	**9,6%**
Totale	**100,0%**	**100,0%**	**100,0%**

ALCUNI DATI RELATIVI AI BORGHI ITALIANI

L'ITALIA CHE CONTA



Grafica | TERRE DI NESSUNO. FAI - Fondo Ambiente Italiano. | XXIV Convegno Nazionale dei Delegati e dei Volontari FAI © Lorenzo Terranera, 2020.

5.308
paesi abbandonati

---

72 %
paesi fantasma

1/5
popolazione italiana che vive in un piccolo comune

2.831
comuni a rischio scomparsa

100mila
Kmq di superficie italiana

> centro-sud
> zone appenniniche

I.4.4 La Rinascita dell'Appennino

Le montagne dell'Appennino[1], benché possano essere state oscurate dalla fama delle imponenti Alpi, rivendicano con orgoglio una vastità geografica e un'influenza storica di primaria rilevanza nell'ambito della penisola italiana. Funzionando come una spina dorsale che attraversa lo stivale, l'Appennino non solo divide l'Italia in due macroregioni distintive, ma ha anche plasmato con profondità la cultura, l'economia e l'identità nazionale attraverso i secoli. Già dall'epoca romana, l'Appennino ha rappresentato un fondamentale percorso di comunicazione, agevolando il commercio e la diffusione di culture tra varie popolazioni. I suoi boschi lussureggianti e le terre fertili hanno sostenuto l'agricoltura e la pastorizia per millenni, contribuendo così alla prosperità della penisola (Ciuffetti, 2019). Inoltre, l'Appennino ha ispirato una moltitudine di artisti e letterati, tra cui Dante Alighieri e Francesco Petrarca, i quali hanno esaltato la sua bellezza paesaggistica e il suo significato simbolico.

Nonostante il glorioso passato, l'Appennino si trova oggi ad affrontare una serie di sfide significative. L'abbandono delle sue aree interne, scaturito da una complessa combinazione di fattori tra cui la carenza di servizi, le difficoltà di accesso e la mancanza di opportunità occupazionali, ha portato ad un declino demografico ed economico (Dematteis, 2020). Questa marginalizzazione ha inoltre innescato il degrado ambientale e la perdita di biodiversità; dati ufficiali attestano tale problematica come l'Istituto Nazionale di Statistica (ISTAT), che tra il 2001 e il 2021 evidenzia la diminuzione della popolazione delle aree interne dell'Appennino del 15%.

Nel 2023, il tasso di disoccupazione giovanile nelle medesime aree era del 25%, triplicando la media nazionale del 10%.

Nel corso degli ultimi dieci anni, il numero di aziende agricole nell'Appennino è sceso del 20%.

Tuttavia, un'opportunità per una rinascita dell'Appennino si profila all'orizzonte proprio grazie alla srategia degli *Smart Villages,* richiedendo un impegno tangibile e una visione strategica a lungo termine. È imperativo intervenire in diverse aree chiave:

- **infrastrutture e digitalizzazione:** Investire in infrastrutture digitali e di trasporto per migliorare la connettività e l'accessibilità delle aree interne.
- **sviluppo economico:** Promuovere lo sviluppo di attività economiche sostenibili, quali l'agriturismo, l'ecoturismo e la manifattura artigianale;
- **valorizzazione del territorio:** Incentivare la riqualificazione e il recupero dei centri minori e la valorizzazione del patrimonio culturale e paesaggistico;
- **politiche di sostegno:** Promuovere politiche di sostegno alle famiglie e alle imprese che scelgono di stabilirsi e operare nell'Appennino.

Solo attraverso un'azione concertata e risoluta sarà possibile trasformare le sfide attuali in opportunità di crescita e sviluppo sostenibile per l'intera regione appenninica.

Di seguito un escursus, mediante infografiche, delle dinamiche sociiali e della marginalità delle terre appenniniche tratte da la Ressegna Stampa della Camera dei Deputati di domenica 17 marzo 2024 a cura di Data Stampa che mostrano le condizioni dell'Appennino nel 2024 a seguito delle strategie nazionali per la rivitalizzazione dei territori appena trascorsa.

[1] Gli appennini costituiscono la spina dorsale italiana, connettendo in modo tangibile i due versanti della penisola. Uno spazio eterogeneo dai plurimi caratteri geo-morfologici, ecologici, storici, antropologici, sociali e istituzionali. È il risultato di un lungo processo di coevoluzione tra l'uomo e l'ambiente, costituito da continuità e fratture, che ha depositato i sedimenti materiali e cognitivi costantemente in evoluzione e trasformazione. Per secoli, questa dorsale ha mantenuto una ricca biodiversità naturale e ha fornito importanti servizi ecosistemici, come l'acqua fondamentale per lo sviluppo delle attività proto.industriali. I boschi e i terreni a pascolo hanno sostenuto un'economia agro-silvo-pastorale basata sulla pluriattività con modalità che rimandano ai beni comuni e agli usi civici, contribuendo a creare specificità tutt'ora riscontrabili nel paesaggio e nella cultura locali...

Guardando al futuro, per favorire una rinascita degli Appennini, accanto alle politiche place-based avviate per incentivare l'occupazione, potenziare le infrastrutture e assicurare trasporti efficienti, migliorare l'accesso ai servizi sanitari e all'istruzione di qualità, diventa imprescindibile concentrarsi anche sulla cura e della manutenzione del territorio. Tale aspetto costituisce un presupporto fondamentale per la prevenzione dei rischi ambientali e antropici.
da Carallo S. (2024) Appennini, In Tomeo N. (a cura di) 2024. Vocabolario delle aree interne. 100 parole per l'uguaglianza dei territori. Radici Edizioni.

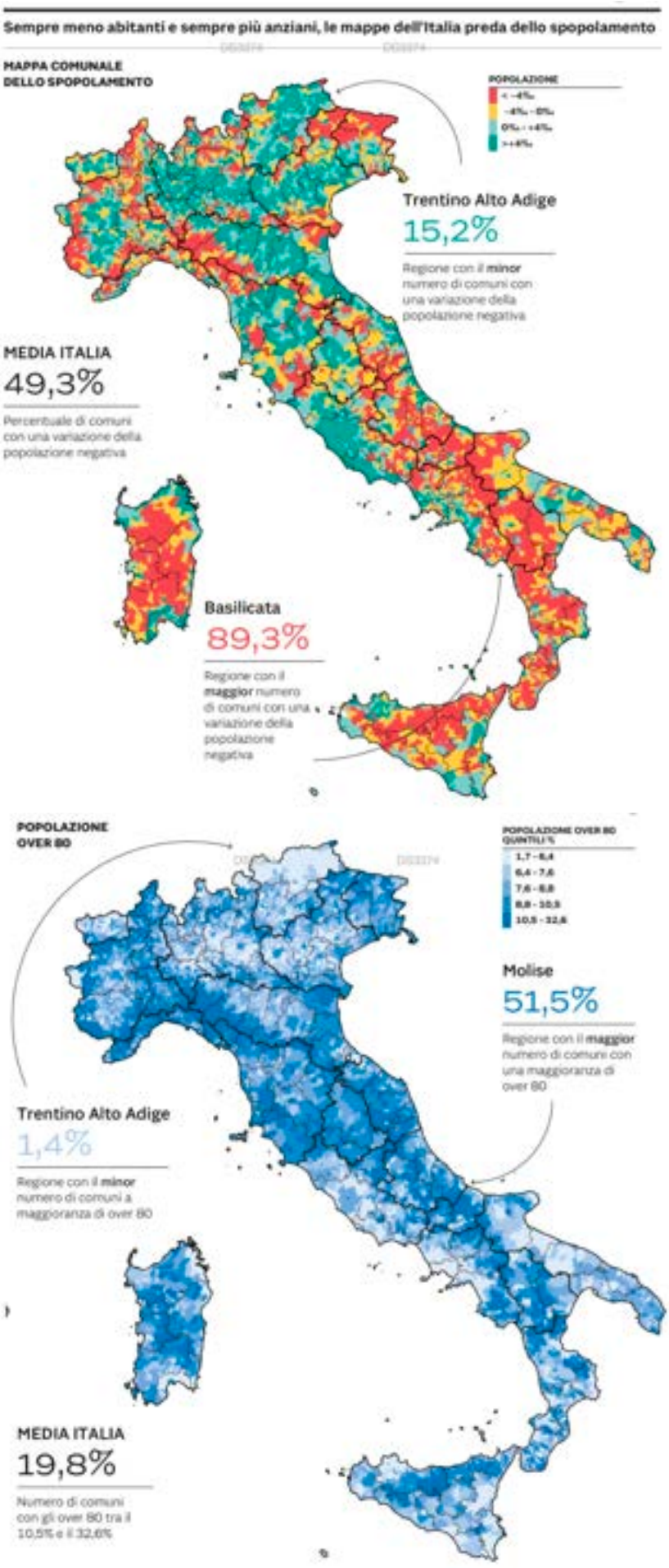


Fig. I.4.4.1 | Rassegna stampa Camera dei Deputati, 17 marzo 2024 (a cura di Data Stampa)

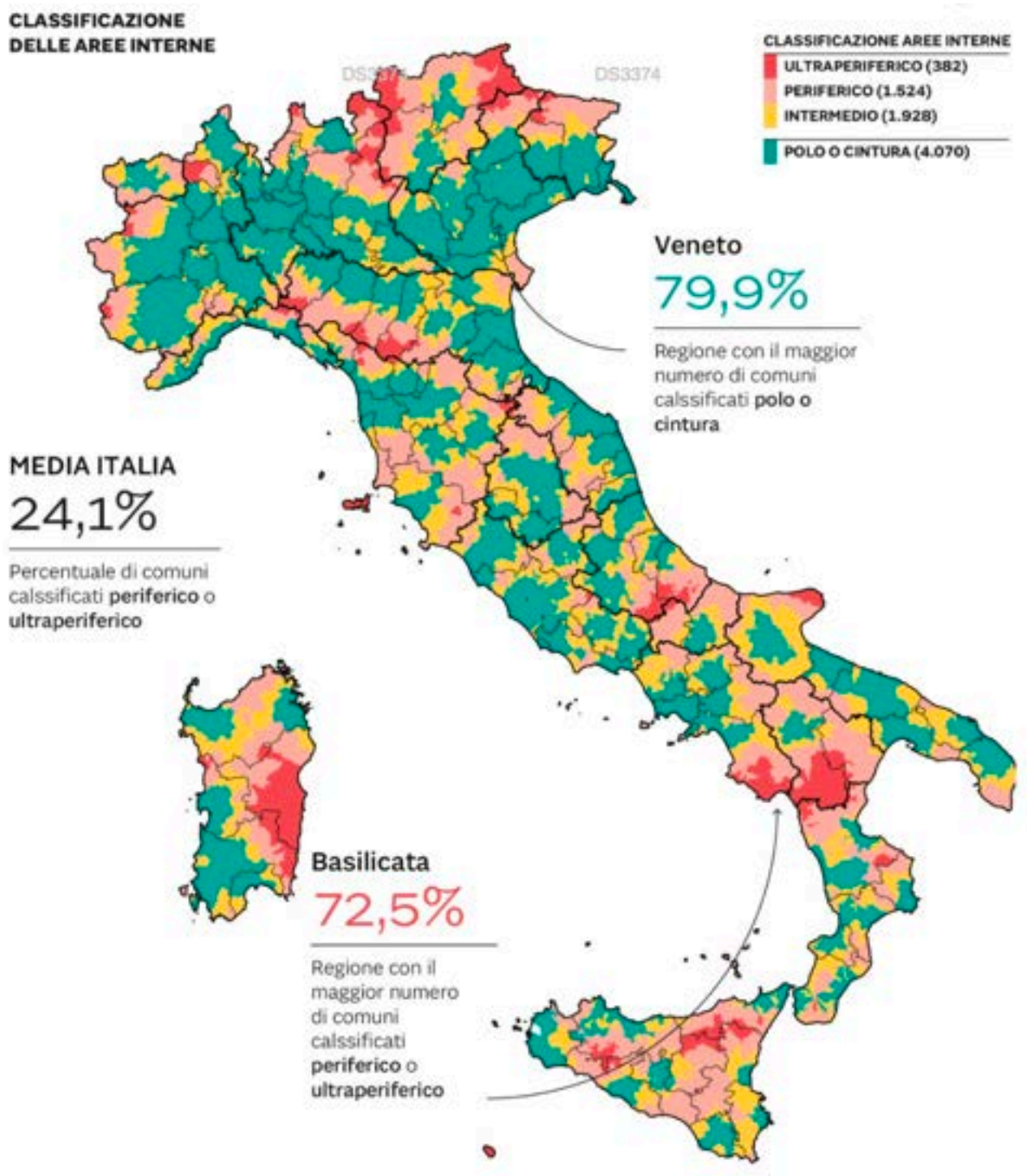


Fig. I.4.4.2 | Rassegna stampa Camera dei Deputati, 17 marzo 2024 (a cura di Data Stampa)

L'immagine rappresenta la distribuzione delle aree ultraperiferiche, periferiche e intermedie in Italia, evidenziando le disparità territoriali tra le diverse regioni. In particolare, si osserva un picco significativo in Veneto e in Basilicata. Il Veneto è la regione con il maggior numero di comuni classificati come polo o cintura, che si trovano in posizioni strategiche rispetto alle aree circostanti e favoriscono lo sviluppo e la centralità. Al contrario, la Basilicata si distingue per il numero maggiore di comuni periferici e ultraperiferici, che affrontano sfide legate alla distanza dai centri urbani principali e alla difficoltà di accesso a risorse e servizi. Questo schema sottolinea l'importanza di politiche di sviluppo e di integrazione per ridurre le disuguaglianze territoriali e promuovere un equilibrio tra le varie aree del paese.

«In gioco il futuro del Paese ma ogni area richiede soluzioni caso per caso»

L'intervista. Cecilia Tomassini. «È necessario affrontare il tema del welfare e dell'assistenza»

Non ha funzionato l'idea che la crescita sarebbe partita dai centri urbani per arrivare alle periferie
Carlo Marroni

«Comprendere bene il fenomeno delle aree interne è essenziale per il futuro dell'Italia, sia per il controllo e la vitalità del territorio, ma anche per rappresentatività politica, quindi un tema di democrazia. Serve una politica a lungo termine, ma con un'avvertenza: ogni area è diversa, non c'è un unico approccio valido per tutte. Il fenomeno va studiato a fondo, e di continuo». Cecilia Tomassini, professoressa ordinaria di Demografia presso l'Università del Molise, lavora da anni in équipe dentro il suo ateneo sul tema delle aree interne, che si lega alle molte problematiche dell'Italia, a partire dall'inverno demografico.

Partiamo da qua, dal numero di italiani che cala costantemente.
L'Italia perde popolazione dal 2015 – eravamo 60,7 milioni, ora siamo sotto 59 – ma il fenomeno non è uniformemente distribuito sul territorio. Si conoscono bene le dinamiche demografiche Nord-Sud: ad un settentrione più vivace dal punto di vista demografico, grazie ad un saldo naturale (nascite meno morti) seppure negativo in parte compensato da un saldo migratorio positivo (immigrati meno emigrati), si contrappone un Mezzogiorno in notevole difficoltà in entrambe le componenti. A queste dinamiche note, da una decina di anni vengono invece prese in considerazione anche le dinamiche che riguardano il divario centro-periferie.

Una criticità specifica immersa dentro un declino generale...
Da una parte l'Europa con due documenti nel 1999 e nel 2021, dall'altra la Strategia nazionale per le aree interne, proposta in Italia nel 2014, evidenziavano sia le criticità delle aree periferiche ma anche le potenziali opportunità. Questi documenti mettevano in luce come l'idea sviluppata negli anni del boom economico che la crescita economica e demografica partisse dai centri urbani e si diffondesse a quelli periferici in modo bilanciato e armonioso non solo non fosse vera, ma anzi avesse prodotto un maggiore divario fra centro e aree interne.

Il divario tra aree centrali e periferiche si va accentuando?
L'Italia ha una conformazione particolare delle aree interne: dalla mappa qui riprodotta possiamo notare come siano diffuse su tutto il territorio nazionale e in termini chilometrici, le distanze con i centri sono meno ampie rispetto ad altri paesi europei. Ma le problematiche sono simili: crescente fragilità economica, abbandono delle giovani generazioni, pochi servizi essenziali, disinteressamento dei governi centrali, fattori che contribuiscono ad alimentare un circolo vizioso di spopolamento, invecchiamento e marginalizzazione. Da un'osservazione generale possiamo individuare aree interne in cui questi processi sono ormai sistemici da molti anni ed altre invece che per ragioni diverse hanno frenato la caduta libera della popolazione locale. Questo ci porta ad una prima importante osservazione: essere area interna non necessariamente implica un processo spopolamento ed invecchiamento della popolazione.

Poi c'è l'invecchiamento, che colpisce di più le aree interne.
L'invecchiamento della popolazione, fenomeno che interessa, pur con intensità diversa, la maggior parte dei paesi industrializzati, è particolarmente marcato nelle aree di spopolamento sistemico, quelle cioè caratterizzate da decenni di decrescita demografica dovuta ad una dinamica naturale e migratoria negativa. La proporzione di ultra ottantenni nella mappa mostra come siano i comuni urbani quelli meno interessati al fenomeno, mentre le aree interne del paese sia per la bassa fecondità, sia per la forte emigrazione dei giovani verso i centri urbani, sia per la bassa attrattiva per le migrazioni internazionali stanno invecchiando molto rapidamente, soprattutto nel sud Italia.

Però non tutte le aree vedono lo stesso fenomeno.
Alcune aree interne del Nord Italia però (soprattutto in Trentino) non stanno sperimentando un rapido invecchiamento della popolazione, evidente invece nelle aree interne della Liguria, della Sardegna e della dorsale appenninica. Per le aree interne, l'essere "lontane" e, come abbiamo visto, essere fortemente invecchiate, può portare ad una forte richiesta di servizi di assistenza agli anziani vista la scarsità delle generazioni che possono dare aiuto informale e una certa frammentarietà della copertura di servizi sociali ed assistenziali. Questo sarà un tema molto importante per il prossimo futuro e il partenariato esteso Age-It finanziato dal Pnrr e dal ministero per la Ricerca lo sta studiando approfonditamente pensando a soluzioni innovative.

Quindi il fenomeno è monitorato, ma serve un'analisi in grado di generare decisioni.
Per capire cosa succede allo spopolamento delle aree interne occorre innanzi tutto studiare l'andamento di lungo periodo dei cambiamenti demografici: perché alcuni comuni perdono popolazione da quaranta anni, altri da venti e alcuni solo recentemente? Alcuni comuni delle aree interne, benché situati in zone di montagna, non sembrano soggetti a processi sistemici di spopolamento: potrebbe essere un buon segno nell'ottica di una nuova resilienza per i piccoli comuni delle zone interne? Se sì, perché? Quale impatto hanno le condizioni socio-economiche e infrastrutturali sul gradiente di spopolamento comunale?

Tutte domande che segnalano come sia un fenomeno molto complesso, diversificato e in movimento.
Ad esempio, agire sull'occupazione giovanile o femminile, sulle migrazioni internazionali può in qualche modo frenare la contrazione della popolazione? Creare una scuola o un ospedale può essere un deterrente per lo spopolamento? Usando metodologie innovative statistico-geografiche, ad esempio rileva come l'occupazione femminile ha un impatto positivo e significativo sulla tenuta della popolazione in alcune aree interne, ma allo stesso tempo è risultato ininfluente in altre zone: un segno evidente della diversa capacità demografica dei territori di reagire ai fenomeni economici, sociali, culturali e istituzionali.

Fig. I.4.4.3 | Rassegna stampa Camera dei Deputati, 17 marzo 2024 (a cura di Data Stampa)

La fotografia

1

LE AREE INTERNE

I Comuni periferici

Le Aree Interne sono rappresentate dai Comuni italiani più periferici, in termini di accesso ai servizi essenziali (salute, istruzione, mobilità) e quindi maggiormente distanti rispetto ai centri di offerta di servizi. La classificazione delle Aree Interne è il risultato di un percorso metodologico avviato dall'ex-Agenzia per la Coesione Territoriale, all'interno della Strategia Nazionale per le Aree Interne (SNAI), che ha visto coinvolti l'Istat, la Banca d'Italia e le Regioni. Per individuare i comuni che ricadono nelle aree interne, per prima cosa vengono definiti i Comuni "polo", cioè le realtà territoriali che offrono contemporaneamente (da soli o insieme ai confinanti):
A. un'offerta scolastica secondaria superiore completa, cioè almeno un liceo (classico o scientifico) e almeno uno fra istituto tecnico e istituto professionale;
B. almeno un ospedale con capacità operative avanzate;
C. una stazione ferroviaria medio-piccola con più di 2.500 passeggeri al giorno.
Maggiore è la distanza dal comune che offre simultaneamente questi tre servizi, maggiore è la connotazione periferica del comune in esame

2

INVECCHIAMENTO

Il peso degli over 80

Nel 19,8% dei comuni italiani (1565 su 7904) gli anziani con più di ottanta anni segnano una forte presenza, tra un decimo ed un terzo dell'intera popolazione. La Regione con il più alto numero di comuni con forte presenza anziana è il Molise (51,5%, 70 comuni su 136), seguita dalla Liguria (50,4%, 118 comuni su 234) e dall'Abruzzo (40%, 122 comuni su 305).
All'opposto, in Trentino-Alto Adige/Südtirol ed in Veneto il numero di comuni con una forte presenza anziana non superano il 5% (sono infatti solo l'1,4% in Trentino ed il 4,1% in Veneto).
In Trentino-Alto Adige in particolare, quasi la metà di comuni sono caratterizzati da una struttura molto più giovane del collettivo nazionale. Il 48.9% dei comuni trentini e altoatesini, 138 comuni su 282, segnano infatti una presenza di ultraottantenni inferiore al 6,4%.

Fig. I.4.4.4 | Rassegna stampa Camera dei Deputati, 17 marzo 2024 (a cura di Data Stampa)

Fig. I.4.4.5 | Santa Fiora, il primo borgo dello smart working in Italia © Dove Viaggi - Corriere, 2020.

Aree tutelate nell'Appennino e nel resto d'Italia

	Appennino		Resto d'Italia	Totale Italia
Parchi Nazionali	12 parchi	48%	13 parchi	25
Parchi Regionali	36 parchi	26,8%	108 parchi	134
Rete Natura	993 siti	38,2%	1.603 siti	2.596

Fig. I.4.4.6 | L'Italia dell'Appennino e i Parchi; ©Data Stampa, 2023

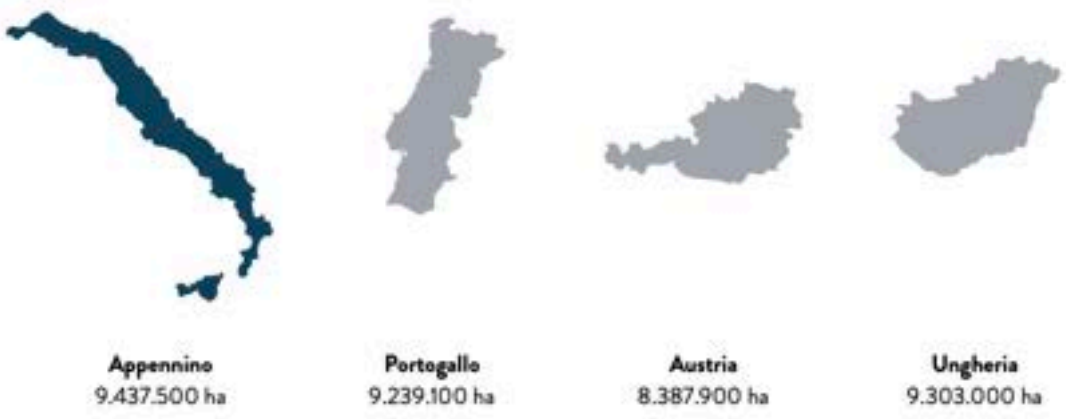


Fig. I.4.4.7 | L'Appennino italiano, geografia e distinzione; ©Data Stampa, 2023

I.5 Normativa di riferimento europea

La promozione e lo sviluppo degli *Smart Villages* rappresenta una priorità di rilevanza non solo a livello italiano, ma anche europeo ed extraeuropeo. L'importanza di queste iniziative è enfatizzata dalla sua connessione con il *Green Deal* Europeo, il quale, con l'ambizione di neutralità climatica e transizione ecologica, offre un'opportunità unica per lo sviluppo dei territori (Comunicazione della Commissione Europea, 2021).

Il *Green Deal* Europeo offre un quadro ambizioso e trasversale, il quale può essere integrato in modo sinergico con lo sviluppo gli *Smart Villages*. Settori chiave come l'efficienza energetica, le fonti energetiche rinnovabili, l'economia circolare, la mobilità sostenibile e l'agricoltura sostenibile rappresentano aree in cui l'innovazione può contribuire significativamente agli obiettivi del *Green Deal*.

Progetti finanziati come *Smart Rural Communities, RURBAN+,* e *RE-Scoop*, illustrano il concreto impegno a favore dello sviluppo di comunità intelligenti e sostenibili in Europa. L'integrazione del *Green Deal* nelle strategie e nei piani di finanziamento per i Villaggi Intelligenti è cruciale per garantire una transizione verso un futuro sostenibile e resiliente nelle aree rurali europee (Rete europea per lo sviluppo rurale, 2021).

A livello europeo, la Commissione Europea ha implementato diverse iniziative e programmi di finanziamento, come la Strategia Europea per le Comunità *Smart*, il Programma Horizon Europe, il Fondo Europeo per lo Sviluppo Regionale (FESR), e il Fondo Europeo Agricolo per lo Sviluppo Rurale (FEASR). Questi strumenti forniscono il supporto finanziario necessario per incoraggiare lo sviluppo degli *Smart Villages* in un contesto europeo più ampio.

In particolare la Strategia Europea per le Comunità *Smart*, che ha l'obiettivo di aiutare le comunità a diventare più intelligenti e resilienti attraverso l'uso delle tecnologie digitali; Il Programma *Horizon Europe*, che finanzia progetti di ricerca e innovazione nel campo dell'intelligenza artificiale, della robotica, della mobilità sostenibile e altri settori chiave per lo sviluppo degli *Smart Villages*; Il FESR - Fondo Europeo per lo Sviluppo Regionale, che finanzia progetti di sviluppo economico e sociale nelle aree rurali, compresi quelli relativi allo sviluppo degli *Smart Villages*; Il FEASR - Fondo Europeo Agricolo per lo Sviluppo Rurale, che finanzia progetti di sviluppo rurale sostenibile, compresi quelli relativi allo sviluppo degli *Smart Villages*.

In Italia il PNRR (Piano Nazionale di Ripresa e Resilienza), il PSRN (Programma di Sviluppo Rurale Nazionale) e la Legge di Bilancio 2023 sono solo alcuni degli strumenti chiave nel finanziamento di progetti di digitalizzazione, sostenibilità e partecipazione nelle aree rurali italiane.

Lo sviluppo di *Smart Villages* rappresenta una priorità sia a livello europeo che italiano. Poichè il caso studio analizzato riguarda un enclave all'interno dell'Unione Europea, verranno affrontata ed analizzate tutte le strategie e regolamentazioni europee, escludendo il resto delle politiche adottate al di fuori. L'Unione Europea ha, infatti, da tempo riconosciuto il potenziale degli *Smart Villages* per promuovere la crescita economica, la coesione sociale e la sostenibilità ambientale nelle aree rurali. In linea con questo obiettivo,

[1] Sito ufficiale della Commissione Europea: https://commission.europa.eu/index_it

la Commissione Europea[1] ha adottato una serie di iniziative e programmi di finanziamento per sostenere lo sviluppo dei territori minori.

Queste iniziative e programmi di finanziamento stanno contribuendo a creare un ecosistema favorevole allo sviluppo degli *Smart Villages* in Europa. Grazie a questi interventi, sempre più villaggi rurali stanno adottando soluzioni innovative per migliorare la qualità della vita dei loro abitanti, promuovere la crescita economica e proteggere l'ambiente. Rappresentano un'opportunità davvero importante per le aree rurali europee perchè, attraverso l'uso delle tecnologie digitali, possono migliorare la qualità della vita dei residenti, promuovere la crescita economica e proteggere l'ambiente. Sempre più villaggi rurali europei stanno diventando *smart* e questo trend è destinato a continuare a crescere nei prossimi anni.

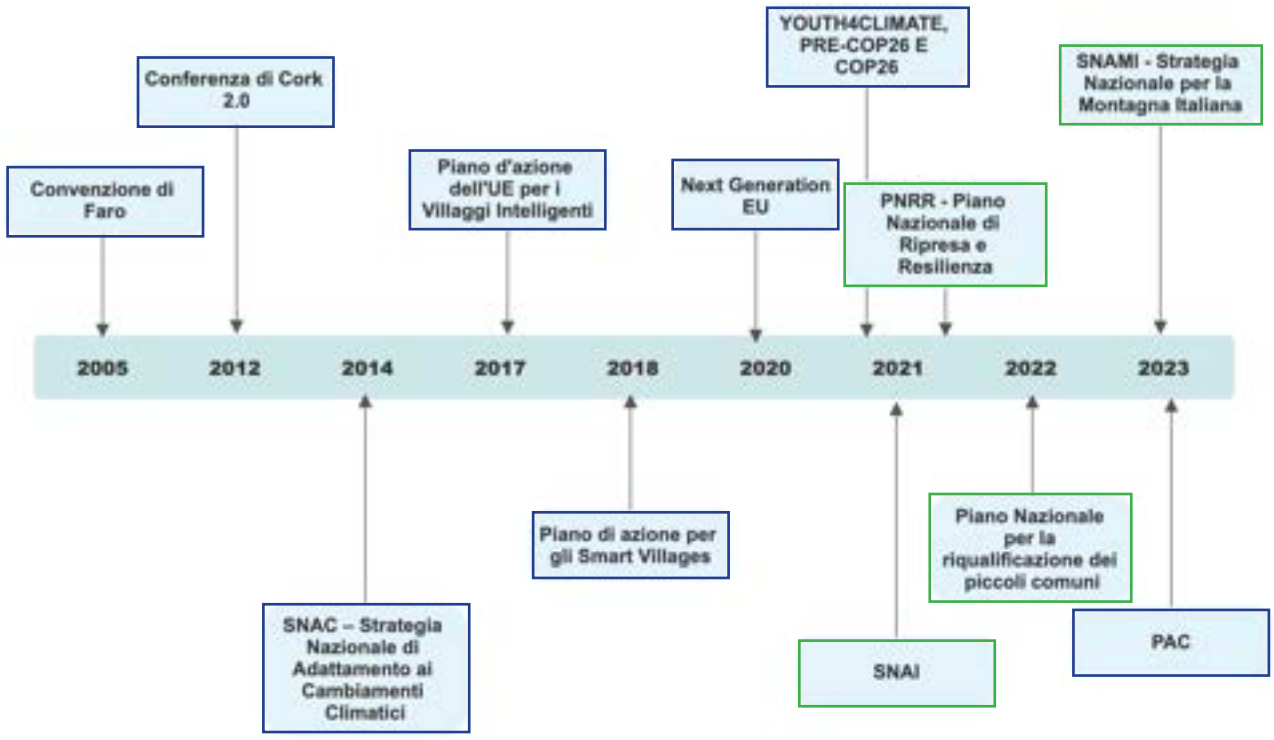


Fig. I.5.1 | Timeline della normativa di riferimento. ©Luisa Lombardo, 2023.

La linea temporale presenta lo sviluppo delle strategie europee e italiane per le aree rurali dal 2005 a oggi, evidenziando i principali momenti e le tappe cruciali nell'evoluzione delle politiche agricole e rurali. Inizia con le prime iniziative relative alla sostenibilità e al rafforzamento delle economie locali, seguite dall'introduzione di politiche orientate alla digitalizzazione e all'innovazione nelle aree rurali. Vengono esaminati i principali strumenti e programmi della Politica Agricola Comune (PAC) e le politiche europee che hanno incentivato la transizione verso un modello di sviluppo più inclusivo e sostenibile. A livello italiano, vengono mostrati gli sviluppi normativi e le iniziative specifiche per le aree interne, con un accento sull'integrazione delle risorse locali, la creazione di smart villages e la promozione della coesione sociale e territoriale. La linea temporale mette in evidenza come questi interventi abbiano gradualmente portato alla creazione di strategie integrate che rispondono alle sfide moderne delle aree rurali, cercando di conciliare la tradizione con le nuove esigenze tecnologiche e ambientali. Ogni fase riflette un adattamento delle politiche per garantire un futuro più resiliente e prospero per le zone rurali, con un focus sull'innovazione, la sostenibilità e la crescita inclusiva.

I.5.1 La Convenzione di Faro

La Convenzione di Faro, nota anche come STCE n°199, è un accordo di primaria importanza che delinea e enfatizza gli elementi salienti relativi al patrimonio culturale, soprattutto in rapporto ai diritti umani e alla democrazia. Mira a promuovere una visione più inclusiva del patrimonio culturale e delle sue relazioni con le comunità e la società. Particolarmente significativo è il suo richiamo ai luoghi di interesse che vanno apprezzati per i significati e gli usi che le persone vi attribuiscono, così come per i valori che rappresentano. Definita come una "convenzione quadro", delinea le tematiche rilevanti, gli obiettivi generali e le possibili aree d'intervento per gli Stati membri. Questi ultimi godono di discrezionalità nell'individuare i mezzi più idonei per la sua attuazione, facendo riferimento al proprio quadro giuridico, istituzionale e alle specifiche esperienze, non impone obblighi d'azione specifici, ma suggerisce linee guida orientative.

Adottata dal Comitato dei Ministri del Consiglio d'Europa il 13 ottobre 2005 e aperta alla firma degli Stati membri a Faro, Portogallo, il 27 ottobre dello stesso anno, la Convenzione è entrata in vigore l'1 giugno 2011. Attualmente, venticinque Stati membri del Consiglio d'Europa hanno ratificato la Convenzione, mentre quattro Stati l'hanno firmata.

Così denominata in omaggio alla città portoghese di Faro, sede dell'evento inaugurale per la firma degli Stati membri del Consiglio d'Europa il 27 ottobre 2005, l'adesione dell'Italia, avvenuta il 27 febbraio 2013 a Strasburgo, ha portato il numero degli Stati Parti a 21, su un totale di 47 membri del Consiglio d'Europa, con 14 di essi che hanno ratificato i principi della Convenzione. Come ultima fra le Convenzioni culturali internazionali, si fonda sul presupposto che la conoscenza e l'utilizzo del patrimonio culturale siano diritti individuali riconosciuti nella Dichiarazione universale dei diritti dell'uomo[1] (Parigi, 1948) e tutelati dal Patto internazionale sui diritti economici, sociali e culturali[2] (Parigi, 1966). Tale approccio consente ad ogni individuo di partecipare liberamente alla vita culturale della comunità e di godere delle arti. La Convenzione si integra con gli strumenti internazionali già esistenti essi, invitando le popolazioni a svolgere un ruolo attivo nel riconoscimento dei valori del patrimonio culturale e incoraggiando gli Stati a promuovere un processo di valorizzazione partecipativo, che coinvolga istituzioni pubbliche, cittadini privati e associazioni. Si propone di armonizzare le politiche di valorizzazione europee, tenendo conto dei processi in corso di democratizzazione della cultura e di *open government*. Riconosce nella partecipazione attiva dei cittadini e delle comunità la chiave per accrescere in Europa la consapevolezza del valore del patrimonio culturale e del suo contributo al benessere e alla qualità della vita. Rappresenta uno degli approcci al patrimonio culturale che avvicina al concetto degli *Smart Villages*.

La scelta di Fontecchio come sede del primo *workshop* di ricerca-azione sulla Convenzione di Faro, un piccolo borgo abitato da circa 400 persone situato nella Valle dell'Aterno, in Abruzzo, non è casuale. Nel 2013, Fontecchio è diventato il primo piccolo comune italiano ad aderire ai principi della Convenzione, evidenziando una sensibilità profondamente radicata in questa comunità nei confronti del proprio patrimonio culturale, tangibile, intangibile e naturale. Già durante il terremoto dell'Aquila del 2009, Fontecchio aveva dimostrato una profonda consapevolezza dell'importanza dell'eredità culturale e dei beni artistici e architettonici ad essa collegati, considerati dalla comunità stessa elementi strategici e imprescindibili per la trasmissione della memoria alle generazioni future. Subito dopo il tragico evento, ha avviato il progetto "Borghi Attivi", promuovendo un percorso di democrazia deliberativa per delineare linee guida per lo sviluppo locale e l'estetica del paese, volto anche a coinvolgere privati con l'obiettivo principale di fornire alloggi con buoni o ottimi standard di qualità a canone calmierato. Da queste linee guida è emerso successivamente "Casa&Bottega", uno strumento collettivo a difesa dell'occupazione e del paesaggio, favorevole alla *housing* sociale e alla rigenerazione urbana.

[1] La Dichiarazione universale dei diritti umani, anche nota come Dichiarazione universale dei diritti dell'uomo, è un documento sui diritti della persona, adottato dall'Assemblea generale delle Nazioni Unite nella sua terza sessione, il 10 dicembre 1948 a Parigi con la risoluzione 219077A.

[2] La Convenzione internazionale sui diritti economici, sociali e culturali è un trattato delle Nazioni Unite, nato dall'esperienza della Dichiarazione Universale dei Diritti dell'Uomo, redatto dal Consiglio economico e sociale delle Nazioni Unite, adottato nel 1966 ed entrato in vigore il 3 gennaio 1976.

Fig. I.5.1.1 | Convenzione di Faro. ©Ministero della Cultura, 2011.

Fig. I.5.1.2 | Fontecchio; ©Anci Abruzzo.

I.5.2 La Conferenza di Cork 2.0

La Conferenza di Cork 2.0, tenutasi nei giorni 5 e 6 settembre del 2012 nella città di Cork, in Irlanda, ha rappresentato un importante avvenimento promosso dalla Commissione Europea in stretta collaborazione con il governo irlandese. Questo convegno ha riunito oltre 300 partecipanti provenienti da tutti gli Stati membri dell'Unione Europea e da varie nazioni del globo, con l'obiettivo di esaminare le questioni relative allo sviluppo rurale in Europa.

Una tappa cruciale nell'evoluzione delle politiche europee inerenti allo sviluppo delle regioni rurali. Durante il quale i partecipanti hanno avuto l'opportunità di condurre un approfondito dibattito sulle sfide e le opportunità intrinseche alle aree rurali europee e, in parallelo, di elaborare strategie e soluzioni per affrontarle con successo.

Un risultato di notevole rilievo emerso dalla Conferenza di Cork 2.0 è stata l'adozione del nuovo documento in aggiornamento alla Dichiarazione di Cork del 1996. Questa ha conferito un'enfasi particolare al ruolo cruciale svolto dalle aree rurali nell'ambito dello sviluppo sostenibile dell'Europa, identificando al contempo una serie di obiettivi e priorità essenziali per le future iniziative di sviluppo rurale.

Tra le mete chiave delineate dalla Dichiarazione di Cork 2.0, rientrano il potenziamento della qualità della vita nelle regioni rurali, con particolare attenzione rivolta alla fornitura di servizi essenziali e all'accesso a opportunità educative e formative; la promozione della crescita economica e dell'occupazione all'interno delle comunità rurali, riconoscendo il loro innegabile potenziale per l'innovazione e l'imprenditorialità; la preservazione dell'ambiente e delle risorse naturali nelle aree rurali, attraverso l'incoraggiamento di pratiche agricole sostenibili e l'attuazione di misure per la tutela del territorio (Dichiarazione di Cork, 2016).

Parallelamente, la Conferenza di Cork 2.0 ha segnato l'inizio del programma di sviluppo rurale dell'Unione Europea per il periodo 2014-2020, con una dotazione finanziaria di oltre 100 miliardi di euro destinati a supportare progetti finalizzati allo sviluppo rurale.

L'eredità lasciata dalla Conferenza di Cork 2.0 è ancor oggi tangibile, con numerosi Stati membri dell'UE che hanno implementato una serie di progetti e politiche volte a promuovere lo sviluppo rurale sostenibile. La conferenza ha rafforzato il ruolo centrale delle regioni rurali all'interno del contesto europeo e ha delineato una visione chiara per lo sviluppo sostenibile delle comunità rurali in Europa. L'influenza di questo avvenimento perdura, con un impatto duraturo sullo sviluppo rurale in tutta l'Europa continentale.

Fig. I.5.2.1 | Conferenza di Cork 2.0; ©ISPI, 2024

[1] La Conferenza europea sullo sviluppo rurale Cork 2.0, svoltasi a Cork (Irlanda) il 5-6 settembre 2016, ha riunito oltre 340 portatori di interesse dello sviluppo rurale per riflettere sulle sfide e le opportunità cui sono attualmente confrontate le zone rurali d'Europa e sulle modalità per rispondervi al meglio. L'obiettivo precipuo e il principale risultato di questo importante evento sono rappresentati dalla "Dichiarazione 2016 di Cork 2.0: Una vita migliore nelle aree rurali", che ha istituito il quadro futuro della politica e degli interventi a favore dello sviluppo rurale in Europa. La Dichiarazione di Cork 2.0 trae spunto dalla moltitudine di messaggi e idee emersi nei workshop partecipati organizzati nel corso della Conferenza, tra cui i pareri espressi da un'ampia gamma di portatori di interesse dello sviluppo rurale: imprenditori agricoli e forestali, ambientalisti, ricercatori, autorità di gestione dei PSR, ONG, operatori commerciali, Gruppi di azione locale, consulenti, Reti rurali nazionali, membri del Parlamento europeo, revisori e funzionari della Commissione europea. La Dichiarazione di Cork 2.0 giunge a vent'anni esatti dall'innovativa Conferenza europea sullo sviluppo rurale organizzata a Cork nel 1996 che portò alla firma della prima Dichiarazione di Cork, gettando così le basi della politica di sviluppo rurale dell'UE.

I.5.3 Piano d'azione dell'UE per i Villaggi Intelligenti

In occasione del 11 aprile 2017 la Commissione Europea ha presentato il Piano d'Azione dell'UE per i Villaggi Intelligenti, che adotta alcune conclusioni emerse dalla Conferenza di Cork 2.0 del 2016 su *"Una vita migliore nelle aree rurali"*. Questo piano si basa sulle potenzialità e sullo sviluppo di nuove opportunità attraverso l'innovazione tecnologica e la sostenibilità ambientale. L'obiettivo del Piano d'Azione europero (Simonato, 2019) è quello di promuovere la sostenibilità e migliorare la qualità della vita nelle aree rurali e montane. Per farlo, si intende coordinare iniziative legate a politiche europee quali lo sviluppo rurale, lo sviluppo regionale, la ricerca, il trasporto, l'energia e il digitale. Nel dettaglio, i suoi tre obiettivi principali sono:

- **digitalizzazione e connessione:** Promuovere l'adozione delle tecnologie digitali e migliorare la connettività nelle aree rurali, facilitando l'accesso a servizi e opportunità digitali avanzate;
- **sostenibilità e transizione verde:** Favorire la transizione verso un'economia sostenibile, promuovendo la gestione efficiente delle risorse, l'uso delle energie rinnovabili, la tutela dell'ambiente e l'adozione di pratiche agricole sostenibili;
- **inclusione sociale e qualità della vita:** Promuovere l'inclusione sociale, migliorare la qualità della vita nelle aree rurali e garantire servizi essenziali accessibili a tutti, come l'istruzione, la sanità, il trasporto e la cultura.

Le aree di concentrazione del Piano d'azione includono:

- **connettività digitale:** Il Piano d'azione si impegna a garantire l'accesso universale a una connettività digitale di alta qualità per tutte le aree rurali;
- **innovazione tecnologica:** Viene favorita l'innovazione tecnologica nelle aree rurali, con particolare attenzione ai settori dell'agricoltura, dell'energia, dei trasporti e dei servizi sociali;
- **sostenibilità ambientale:** Il Piano d'azione promuove la sostenibilità ambientale nelle aree rurali attraverso l'adozione di tecnologie digitali volte a ridurre l'impatto sull'ambiente;
- **partecipazione delle comunità locali:** Sostiene attivamente la partecipazione delle comunità locali nel processo di sviluppo dei villaggi intelligenti;
- **cooperazione tra gli attori:** Il Piano d'azione incoraggia la collaborazione tra enti pubblici e privati per il progresso dei villaggi intelligenti.

Il finanziamento del Piano d'azione è stato supportato da un investimento di 100 milioni di euro all'interno del quadro del programma di sviluppo rurale dell'Unione Europea per il periodo 2014-2020. In aggiunta, la Commissione Europea ha avviato una serie di iniziative mirate a promuovere lo sviluppo dei villaggi intelligenti, incluso il portale "Villaggi Intelligenti". Tra gli esempi tangibili di come le tecnologie digitali possano migliorare le aree rurali, rientrano:

- **agricoltura di precisione:** L'impiego di tecnologie di intelligenza artificiale per ottimizzare l'uso delle risorse agricole, incrementando la produttività e riducendo l'impatto ambientale;
- **energia rinnovabile:** La gestione e il monitoraggio delle risorse energetiche rinnovabili tramite tecnologie digitali per migliorarne efficienza e accessibilità;
- **mobilità sostenibile:** Miglioramento dei servizi di trasporto pubblico e privato nelle aree rurali attraverso l'utilizzo di tecnologie digitali per agevolare gli spostamenti;
- **servizi sociali:** Fornitura di servizi sanitari, educativi e di assistenza sociale a distanza grazie all'utilizzo delle tecnologie digitali, incrementando l'accessibilità per i residenti delle aree rurali.

Rappresenta una significativa iniziativa per il progresso delle aree rurali in Europa. Offre una vasta gamma di risorse e strumenti volti a potenziare

l'uso delle tecnologie digitali per migliorare la qualità della vita, favorire la crescita economica e preservare l'ambiente all'interno dei villaggi rurali. Poiché queste le aree rurali hanno specifiche necessità e potenzialità, sono prive di modelli o soluzioni standardizzate, si è scelto un approccio allo sviluppo centrato sul capitale territoriale, ovvero l'insieme di risorse sociali, ambientali, economiche, culturali e istituzionali caratterizzanti i luoghi.

Nascono così i borghi "intelligenti" ovvero paesi costituiti da cittadini che, mediante la partecipazione attiva, trovano soluzioni concrete alle sfide quotidiane, interpretando in maniera innovativa le dinamiche che stanno trasformando le zone rurali.

Il concetto di "intelligente" si avvicina al concetto *smart* e si estende all'utilizzo delle tecnologie digitali per promuovere l'innovazione sociale, essere consapevoli dell'energia rinnovabile e della bioeconomia emergente, rispondere alla crescente domanda di prodotti tipici e salubri, adottare l'economia circolare e promuovere l'ecoturismo. Inoltre, si incoraggia la creazione di nuove forme di cooperazione e alleanze tra il mondo agricolo e le diverse componenti del mondo rurale, tra Comuni, privati e società civile.

Numerosi progetti di villaggi intelligenti sono già stati attivati. Le iniziative dell'UE hanno, infatti, l'obiettivo di mettere a disposizione dati, buone pratiche, reti, finanziamenti e normative per sostenere tali esperienze (European Commission, 2021). Alcune di queste iniziative includono:

- il Progetto *SIMRA-Social Innovation in Marginalized Rural Areas*, finanziato dal programma di ricerca e innovazione *Horizon2020*, che definisce un database per l'innovazione sociale nelle aree rurali del Bacino del Mediterraneo, identificando le migliori pratiche e la loro applicazione in un contesto pilota;
- l'iniziativa *SMARTA-Rethinking Rural Mobility*, del Parlamento europeo, che propone soluzioni innovative per il tema della mobilità nelle aree rurali;
- il Progetto *TESS-Transactional Environmental Support System*, finanziato dal 7º programma quadro dell'Unione, che raccoglie 63 iniziative per il clima realizzate da diverse comunità in Europa, evidenziando il potenziale di attenuazione dei cambiamenti climatici e la coesione sociale derivante dalla collaborazione;
- il Progetto *RURITAGE*, coordinato dall'Università degli Studi di Bologna, per promuovere il patrimonio culturale e naturale locale come catalizzatore di sviluppo sostenibile, con sei aree di innovazione per trasformare le aree rurali in laboratori/dimostratori di sviluppo sostenibile;
- il Programma integrato di ricerca e dottorato *RurAction*, finanziato dall'Unione Europea nell'ambito delle azioni *Marie-Sklodowska-Curie di Horizon 2020 Innovative Training Network*;
- la Strategia Macroregionale Alpina, ufficialmente *EUSALP (EU Strategy for the Alpine region)*, accordo firmato nel 2013 dai Paesi dell'Unione Europea: Italia, Francia, Germania, Austria, Slovenia e da due stati extra europei Svizzera e Liechtenstein, per promuovere una gestione sostenibile dell'energia e delle risorse naturali e culturali e la protezione ambientale del territorio, con l'obiettivo di aumentare lo sviluppo dell'area alpina;
- *RUMRA & Smart Villages*, l'Intergruppo sulle aree rurali, montuose e remote, (2014-2019), che promuove lo sviluppo integrato per i territori europei nella loro diversità, favorendo nuove modalità di *governance* e cooperazione, iniziative basate sul luogo e sull'uso della tecnologia, con l'obiettivo di rafforzare l'integrazione e garantire un futuro sostenibile per tutti gli europei;
- il Progetto *SOCLIMPACT*, che mira a mitigare gli effetti del cambiamento climatico e il loro impatto socio-economico sulle isole europee nel periodo 2030-2100, nel contesto della Blue Economy, prospettando e valutando l'impatto dei possibili percorsi di decarbonizzazione;
- il COASTAL, con l'obiettivo di promuovere la collaborazione mul-

ti-attore delle parti interessate costiere e rurali, formulando e valutando soluzioni di business e raccomandazioni politiche per migliorare lo sviluppo culturale, sociale ed economico delle isole;

- *DESIRA (Digitisation: Economic and Social Impacts in Rural Areas)*, un progetto Horizon 2020 (2019-2023) coordinato dall'Università di Pisa, che coinvolge 25 organizzazioni partner (enti di ricerca, ONG e PMI) in un'ottica multi-attore e interdisciplinare. Il progetto mira a migliorare la capacità della società e degli organi politici di rispondere alle sfide che la digitalizzazione genera in agricoltura, silvicoltura e aree rurali;
- il progetto *dRURAL*, che sviluppa e implementa una soluzione digitale che offre molteplici servizi ai cittadini rurali, creando opportunità, crescita economica e miglioramenti della qualità della vita, finanziato da Horizon 2020;
- *RUBIZMO*, un progetto di 42 mesi, finanziato dal programma dell'UE per la ricerca e l'innovazione Orizzonte 2020, avviato a maggio 2018, che mira a scoprire gli ingredienti vitali per lo sviluppo dell'imprenditorialità e dei modelli di business di successo in settori ad alto potenziale come l'alimentazione e l'agricoltura, nuove catene del valore bio-based e servizi ecosistemici.

Il Piano d'Azione dell'UE per i Villaggi Intelligenti rappresenta un importante momento storico che introduce, per la prima volta, il tema dell'intelligenza artificiale e, dunque, il concetto di *smart*, nonché uno strumento operativo per promuovere l'innovazione, la sostenibilità e l'inclusione nelle aree rurali. Attraverso le sue linee guida e iniziative, il piano mira a trasformare le comunità rurali, migliorando l'accesso alla tecnologia, promuovendo la sostenibilità ambientale e favorendo l'inclusione sociale. Implementare con successo il Piano d'Azione richiede un impegno continuo da parte delle istituzioni europee, dei governi nazionali e delle comunità locali per costruire Villaggi Intelligenti moderni, sostenibili e prosperi.

Fig. I.5.3.1 | Italia: Riunione sugli Itinerari Culturali nella Regione Alpina (Routes4U, EUSALP) - Itinerari culturali. ©European Council, 2019.

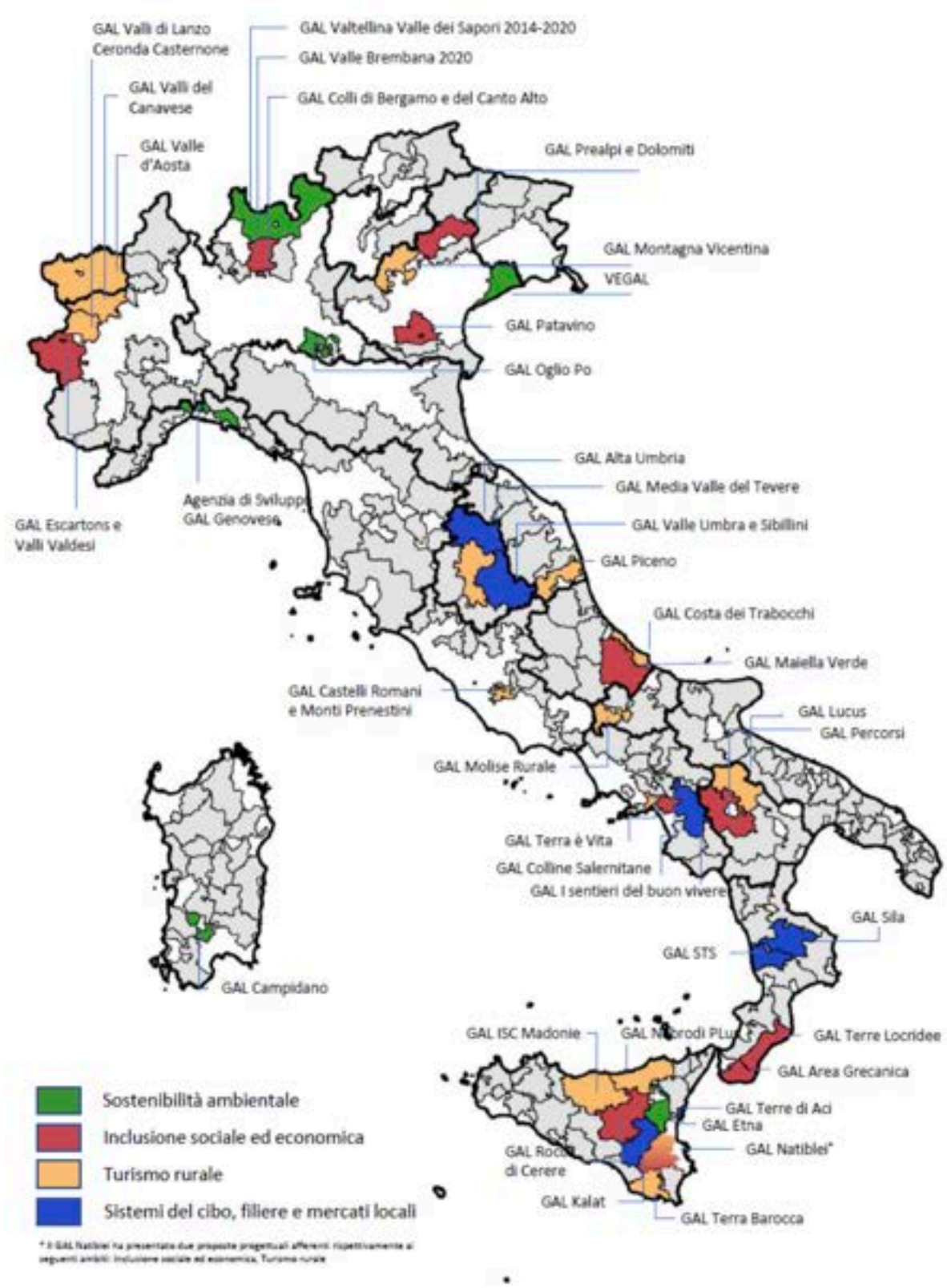


Fig. I.5.3.2 | Mappa dei GAL partecipanti alla Call per ambito tematico prevalentePiano d'azione dei villaggi intelligenti ©CreaBP, 2021

L'immagine illustra la rete dei Gruppi di Azione Locale (GAL) in Italia, che giocano un ruolo fondamentale nel promuovere lo sviluppo delle aree rurali attraverso la gestione dei Fondi Europei per lo Sviluppo Rurale (PSR). Ogni GAL è un'organizzazione territoriale che riunisce diversi attori locali, tra cui enti pubblici, privati e associazioni, con l'obiettivo di progettare e attuare strategie di sviluppo integrato per il miglioramento delle economie locali, la valorizzazione delle risorse naturali e culturali e il rafforzamento della coesione sociale. L'immagine evidenzia la distribuzione geografica dei GAL in Italia, i settori di intervento e le principali iniziative sviluppate per sostenere la crescita economica e la sostenibilità nelle aree rurali, con particolare attenzione alla promozione di pratiche innovative e inclusive.

I.5.4 Il Piano di azione per gli Smart Villages

Il 22 Maggio 2018 a Bruxelles, la Rete Rurale Europea ha presentato il piano di azione per gli *Smart Village*, con una strategia basata su 16 iniziative per supportare e migliorare l'attuazione delle politiche UE[1] a sostegno delle aree rurali. Lo scopo è quello di riflettere sui villaggi del futuro, annunciando una serie di iniziative nel quadro delle politiche e dei fondi europei legati allo sviluppo rurale, allo sviluppo regionale, alla ricerca, al trasporto, all'energia e al digitale.

Il Piano di azione prevede 16 iniziative, tra convegni seminari progetti pilota, in corso o programmate fino al 2020. Si tratta di misure già attivate e finanziate su diverse linee di intervento e che puntano al miglioramento delle attuazioni delle Politiche a sostegno delle aree rurali previste dalla UE e di nuove iniziative direttamente collegate proprio agli *Smart Villages* (Leuba, 2017).

Il RESR ha evidenziato come per molti cittadini europei le aree rurali sono un luogo in cui vivere, lavorare e far crescere la propria famiglia. L'azione dell'UE va in questa direzione ed è un esempio di come l'esistenza di istituzioni comuni renda possibile una maggiore diffusione delle buone pratiche sperimentate per affrontare sfide simili e l'incentivo istituzionale verso una *governance* multilivello. Una *governance* che possa provare a realizzare una convergenza tra i molti strumenti a disposizione delle diverse istituzioni (locali, regionali, statali, europee), garantendo un equilibrio tra esigenze di uniformità di diritti e doveri e valorizzazione delle differenziazioni presenti nelle comunità e nei territori.

Obiettivo delle Direzioni generali coinvolte è individuare *drivers* e fattori di successo per i villaggi intelligenti, vale a dire comunità rurali che sfruttano a pieno le proprie risorse potenziando quelle più tradizionali e, soprattutto, attivandone di nuove, grazie alle tecnologie digitali, alla comunicazione e alle innovazioni, così da creare opportunità e attrattività per i territori rurali. L'esito del progetto dovrebbe portare a individuare soluzioni applicabili in tutta l'Unione europea (Nieto et al., 2019), tenendo conto della diversità dei diversi contesti. Condividere una definizione comune e le caratteristiche dei villaggi ecosociali e intelligenti, con esempi concreti di buone pratiche, dovrebbe essere uno strumento importante per contribuire a migliorare lo sviluppo rurale. Il coinvolgimento di tutti i cittadini supportati da una valida *governance* sarà garanzia di successo.

Sono molteplici le politiche europee che concorrono alla realizzazione di questo progetto, politiche di sviluppo rurale, di coesione e bandi previsti nell'ambito dei programmi come *Horizon 2020* e *Connecting Europe Facility*, attraverso una visione di collaborazione e integrazione dei fondi europei disponibili, ma è soprattutto il FEASR (anche con LAEDER e i PEI) a giocare un ruolo centrale e a mettere a disposizione dei villaggi intelligenti numerosi strumenti di supporto. Sono quasi 100 i miliardi di euro stanziati dal bilancio UE per un totale di 118 progetti di sviluppo rurale per programmi nel periodo 2014-2020. Si tratta di investimenti che riguardano soprattutto il settore ambiente, clima e dei trasporti.

Queste le 16 iniziative del Piano di azione:

1. TWG «Imprese rurali intelligenti» - Rete rurale europea - 2016-2017;
2. TWG «*Smart Villages*» - Rete rurale europea - seconda parte del 2017;
3. Workshop sull'accesso ai dati e alle piattaforme digitali - PEI - aprile 2017;
4. Seminari sullo sviluppo di nuovi progetti attraverso l'utilizzo delle tecnologie - PEI - giu. 2017;
5. Conferenza sull'innovazione in agricoltura e nello sviluppo rurale- Portogallo e DG AGRI - ott. 2017;
6. Bando su progetti pilota sugli Smart Eco Villages- DG AGRI - 2017-2018;
7. LEADER/CLLD - Stati membri - 2014-2020;
8. Specializzazione intelligente sull'agroalimentare (S3P Agri-Food) -DG

[1] Ursula von der Leyen, Presidente della Commissione Europea, sostiene a riguardo: "*I villaggi intelligenti possono essere la chiave per un futuro rurale più resiliente, inclusivo e prospero.*"

REGIO, AGRI, JRC, RTD - 2014-2020;
9. Rete di competenze sulla banda ultralarga (BCO) - DG AGRI, REGIO, CNECT - 2016-2020;
10. Centri di innovazione digitale (DIH) - DG CNECT e RTD - 2014-2020;
11. SMARTA - DG MOVE - dal 2016;
12. Internet of Things (IoT) - Horizon 2020 - DG AGRI e CNECT - 2017-2020;
13. Un logistica door-to-door più efficente e intelligente - Horizon 2020 - DG MOVE - 2016-2017;
14. Modelli di impresa per una economia rurale moderna - Horizon 2020 - DG AGRI - 2016/2017;
15. Futuri bandi sotto "rural renaissance" - Horizon 2020 - DG AGRI - 2018-2020;
16. Bioeconomia basata sull'informazione - Horizon 2020 - DG CNECT - 2017-2019.

Negli ultimi due anni la Rete europea per lo sviluppo rurale (RESR) ha effettuato diverse attività per esaminare la prima di queste due sfide, organizzando gruppi tematici sulle filiere e sulle imprese e la loro competitività intelligente. Il gruppo intende diventare un punto di riferimento per condividere esperienze e per dare impulso a nuovi modi di attuare la politica di sviluppo rurale (Wolski et al., 2019).

Gli obiettivi principali sono quindi: sviluppare raccomandazioni ed esempi per migliorare le strategie per la rivitalizzazione di servizi rurali innovativi e rafforzare il ruolo dei PSR, fornire orientamenti, strumenti ed esempi a livello di progetti concreti. Tutti i riscontri derivanti da tali attività saranno poi diffusi attraverso la rete di sviluppo rurale.

Nel contesto italiano sono tanti i piccoli comuni, borghi rurali, in grado di intraprendere il cammino dello *Smart Village* e rappresentare un esempio di sostenibilità e opportunità. La Strategia Nazionale per le Aree Interne, che vedremo successivamente, punta su queste realtà rurali da orientare, così da sfruttare i loro punti di forza consolidandoli e creandone di nuovi, per offrire nuove opportunità di sviluppo (Visvizi et al., 2019).

Fig. I.5.4.1 | The european Smart Villages Observatory ©Rete Rurale Nazionale 2014 - 2020, 2023.

I.5.5 Next Generation EU

Negli ultimi anni, l'Unione Europea ha attraversato un periodo di ripetute crisi finanziarie e recessioni. Le asimmetrie di reddito e occupazione fra gli Stati membri e fra le aree geografiche sono aumentate, acuendo le tensioni sociali e i rischi politici. Nel 2020, l'emergenza sanitaria generata dalla pandemia da Covid19 ha portato a un blocco produttivo di proporzioni inedite e all'adozione di misure d'emergenza con profonde ricadute sul piano sociale. Durante l'epidemia da Covid-19, alla consapevolezza della fragilità comune si è affiancata l'urgenza di una svolta. Gli europei approvato strumenti volti ad affrontare la crisi e a porre le fondamenta per la ripresa.

La vera e propria svolta, di portata storica, è arrivata con l'accordo per finanziare con 750 miliardi l'iniziativa *Next Generation EU*[1] (NGEU).
Tutte le istituzioni sono state impegnate in un'azione coordinata e coerente per il nuovo corso. Già nella prima metà del 2020, la Banca Centrale Europea (BCE) ha proseguito e rafforzato la sua espansione monetaria. La Commissione ha approvato l'uso flessibile delle risorse di bilancio con la Coronavirus Response Investment Initiative (CRII plus), la clausola di salvaguardia generale del Patto di Stabilità e Crescita e il quadro temporaneo relativo alle norme sugli aiuti di Stato. Già prima di NGEU, sono state rese disponibili reti di sicurezza inedite per fronteggiare l'emergenza sociale, economica e sanitaria: SURE, la ricapitalizzazione della BEI, nonché una nuova specifica linea di credito per far fronte alla pandemia all'interno del Meccanismo Europeo di Stabilità (MES), approvata in primavera e disponibile per gli Stati Membri dell'Area Euro (European Commission, 2021).

Da ultimo, a fine dicembre 2020, il Consiglio dell'Unione europea e il Parlamento hanno raggiunto l'accordo sul nuovo Quadro Finanziario Pluriennale per il 2021-2027, superando i veti in uno sforzo di solidarietà e rendendo operative tutte le risorse disponibili per il rilancio dell'Unione.

Next Generation EU (European Commission, 2021) risponde a un'esigenza storica, nuove reti intraeuropee e mediterranee, e l'avvio di infrastrutture collaborative per la scienza e la ricerca, a partire dalla sfida della salute globale.

Esprime l'urgenza e l'opportunità di un vero e proprio Rinascimento economico europeo, con uno strumento che consentirà alla Commissione di ottenere fondi sul mercato dei capitali. Indica la condivisione di una direzione di marcia comune. Una sfida culturale, che impegna tutti i territori. Un processo di trasformazione nella direzione della transizione verde e digitale, che consente all'Unione Europea di recuperare terreno nella corsa tecnologica globale, di creare lavoro buono mantenendo e rinnovando il modello sociale europeo, di affermare una *leadership* globale per lo sviluppo sostenibile, ancor più necessaria dopo gli Accordi di Parigi sul clima.

L'Italia si è fortemente impegnata per la svolta europea. Oggi in un cammino di progressiva condivisione dei rischi per investimenti volti ad affrontare priorità comuni, a recuperare capacità produttiva, a migliorare le infrastrutture materiali e immateriali, ad affrontare la transizione energetica e digitale. La sfida della crescita inclusiva riguarda tutta l'Europa, che deve trovare un nuovo ruolo nella competizione tecnologica e nella riorganizzazione delle catene del valore. Ma riguarda soprattutto l'Italia, dove le crisi precedenti hanno determinato l'acuirsi delle già significative disuguaglianze di genere, generazionali e territoriali, minando nel profondo le capacità di ripresa.

L'Italia intende essere protagonista di questo Rinascimento europeo, attraverso il rilancio degli investimenti pubblici e privati e con riforme volte a rafforzare la capacità e l'efficienza delle istituzioni attraverso il Piano Nazionale di Ripresa e Resilienza, che ne deriva e che sarà affrontato nei prossimi paragrafi, nella programmazione e nell'attuazione degli investimenti, che segna una discontinuità decisiva per lo sviluppo sostenibile, la digitalizzazione e l'innovazione, la riduzione dei divari e delle diseguaglianze soprattutto tra aree rurali e *Smart Cities*. Strumento concepito per plasmare un'Italia più sostenibile e inclusiva, dotata di un'economia avanzata e dinamica.

[1] Un'iniziativa temporanea per la ripresa economica e sociale dai danni immediati causati dalla pandemia di coronavirus, con un budget di oltre 800 miliardi di euro, mirata a creare un'Europa più verde, digitale e resiliente in grado di affrontare le sfide presenti e future.

Fig. I.5.5.1 | Next Generation EU ©European Commission, 2022.

Il Piano, essendo di natura riguardante la ripresa, si propone di affrontare l'impatto economico e sociale derivante dalla crisi pandemica, basandosi sulle lezioni apprese durante alcuni dei periodi più difficili nella storia repubblicana italiana. La ripresa deve plasmare una nuova Italia, sfruttando le opportunità offerte dalla transizione ecologica e digitale. L'obiettivo è liberare il potenziale di crescita dell'economia, aumentare la produttività, generare nuova occupazione e migliorare la qualità del lavoro e dei servizi pubblici, iniziando dalla salute e dall'istruzione. Un'opera di resilienza che implica la preparazione da parte dello Stato, delle imprese e di tutti gli attori sociali per affrontare tali eventi, adattandosi ai cambiamenti della globalizzazione e alle nuove frontiere tecnologiche. Inoltre, assume un carattere riformatore, poiché le linee di investimento sono accompagnate dall'adozione di una strategia di riforme, in linea con le Raccomandazioni della Commissione europea e i Piani Nazionali di Riforma. L'attuazione delle riforme è parte integrante del Piano.

L'azione di rilancio delineata dal Piano è guidata da obiettivi di policy e interventi collegati ai tre assi strategici europei:

- digitalizzazione e innovazione;
- transizione ecologica;
- inclusione sociale.

Queste priorità assumono un ruolo cruciale per l'Italia, affrontando nodi critici come la scarsa propensione all'innovazione e il basso livello di digitalizzazione, che contribuiscono ai deboli tassi di crescita economica e all'insufficiente occupazione. Il Piano consente all'Italia di diventare protagonista del *Green Deal* europeo, riducendo le emissioni inquinanti, creando posti di lavoro nell'economia verde, migliorando l'efficienza energetica e promuovendo processi industriali legati alla transizione verde. La sfida della sostenibilità e della riduzione delle emissioni sarà affrontata anche attraverso soluzioni digitali.

Nel prossimo decennio, la rapida trasformazione digitale sarà centrale nella competizione geopolitica e caratterizzerà le filiere industriali della manifattura italiana e tutti gli aspetti della vita sociale. Il digitale sarà la piattaforma abilitante delle riforme e della competitività. L'investimento capillare nel digitale, su infrastrutture, competenze e cultura, libererà il potenziale di tutti i territori italiani. Perché l'Italia sia veramente sostenibile, è necessario affrontare e ridurre le disuguaglianze di genere, generazionali e territoriali. Pertanto, la realizzazione degli interventi connessi al Piano diventa essenziale per affrontare e risolvere le criticità relative a tre priorità trasversali: le donne, i giovani, il Sud, fondamentale per attivare il potenziale di sviluppo, ripensare le infrastrutture sociali e la macchina pubblica. La missione principale è agganciare e governare i *driver* della crescita del prossimo decennio coinvolgendo tutti i cittadini e le realtà economiche e sociali in uno sforzo collettivo nazionale, affrontando i nodi strutturali che hanno frenato lo sviluppo italiano per troppo tempo.

Fig. I.5.5.2 | Next Generation EU ©FIRST, 2022.

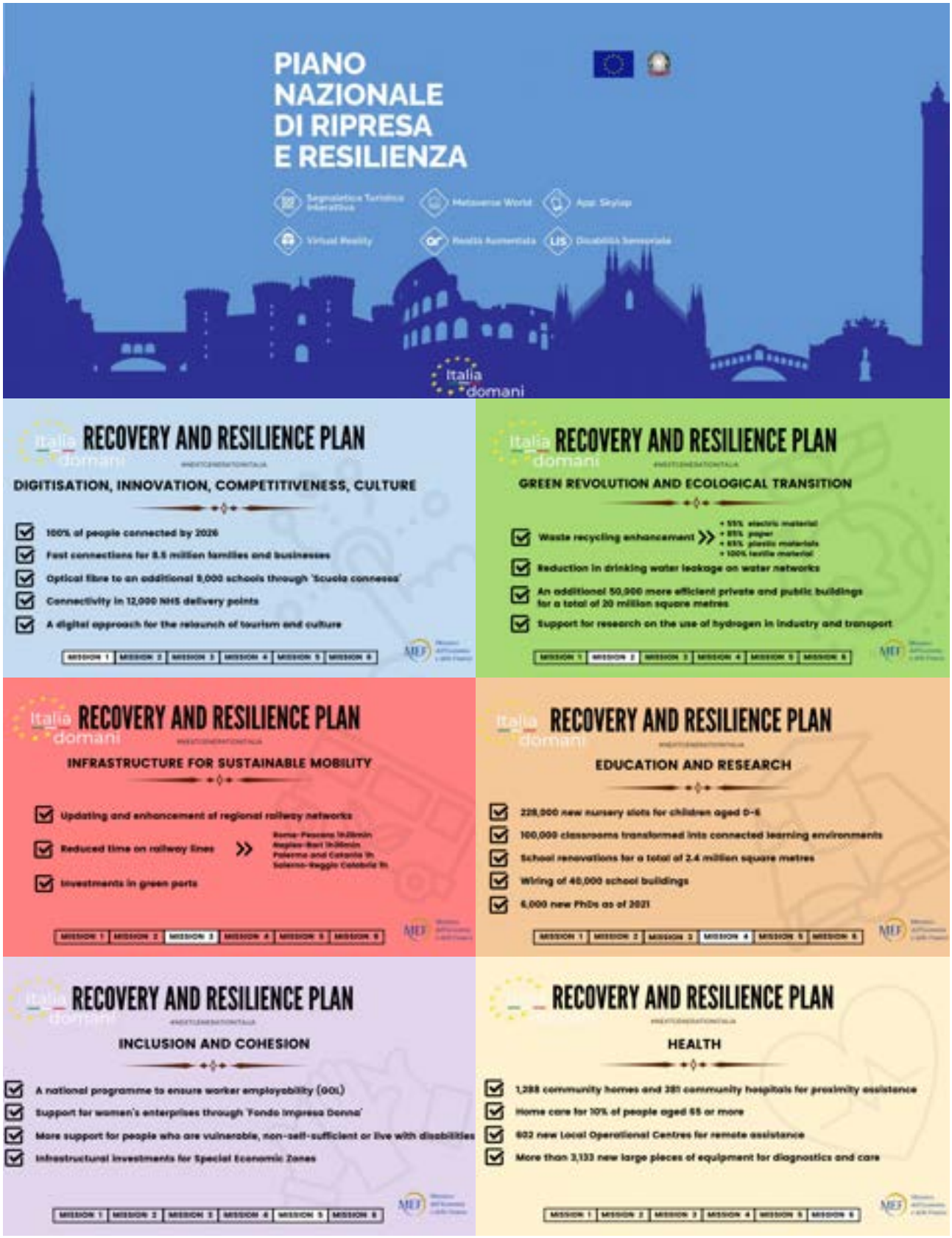


Fig. I.5.5.3 | 6 priority of the Next Generation EU ©Ministero delle Economie e delle Finanze, 2022

L'immagine presenta il Piano Nazionale di Ripresa e Resilienza (PNRR) dell'Italia, un programma strategico finanziato dall'Unione Europea per sostenere la ripresa economica e la resilienza del paese a seguito della pandemia da COVID-19. Il piano è articolato in sei missioni principali, ciascuna focalizzata su specifici ambiti di intervento: Digitalizzazione, innovazione e competitività del sistema produttivo, Transizione ecologica, Infrastrutture per una mobilità sostenibile, Istruzione e ricerca, Inclusione e coesione sociale, e Salute e benessere. L'immagine illustra le priorità di ciascuna missione, evidenziando gli obiettivi di sviluppo sostenibile e la promozione di un'Italia più verde, digitale e inclusiva. Il PNRR mira a ridurre le disuguaglianze, a favorire l'innovazione tecnologica e a garantire una crescita economica equa e duratura, con un focus particolare sulle aree meno sviluppate del paese, comprese le zone rurali.

I.5.6 Youth4Climate, Pre-COP26 e COP26

Nel periodo compreso tra il 28 settembre e il 2 ottobre 2021, si è tenuta l'iniziativa **Youth4Climate**, conosciuta globalmente nel 2002 grazie alla collaborazione tra il Ministero dell'Ambiente e della Sicurezza Energetica e il Programma delle Nazioni Unite per lo Sviluppo. Un importante incontro che ha coinvolto giovani *leader* del clima nell'ambito della preparazione alla Pre-COP26. Consapevoli dell'urgente necessità di affrontare il cambiamento climatico, hanno condiviso soluzioni e partecipato attivamente al dibattito per influenzare positivamente l'agenda. È opportuno sottolineare che tale iniziativa ha focalizzato la sua attenzione non solo su temi climatici globali, ma anche sull'importanza di estendere il suo impatto alle aree interne europee (Ministero dell'Ambiente e della Sicurezza Energetica, 2021).

L'evento è stato promosso dal Ministero italiano per la Transizione Ecologica[1], in collaborazione con **Connect4Climate**[2] del Gruppo Banca Mondiale, con la partecipazione della Regione Lombardia e del Comune di Milano, nonché con il supporto attivo dei volontari del FAI - Fondo Ambiente Italiano[3], Fondazione Santagata, di Italia Nostra e di AIGU - Associazione Italiana Giovani per l'UNESCO. L'iniziativa ha riunito giovani cittadini globali per esaminare le questioni territoriali, comprendendo sia città che centri più o meno periferici, come le aree rurali e remote dell'Italia.

Le discussioni dei giovani *leader* si sono concentrate su quattro tematiche specifiche come il ruolo delle società civili nell'adattamento ai cambiamenti climatici, l'importanza della transizione ecologica nel patrimonio culturale; le azioni per la salvaguardia, il pronto intervento e la prevenzione del patrimonio culturale fragile; l'utilizzo dei sistemi informatizzati per la conoscenza dei rischi legati al patrimonio culturale. Questo incontro ha facilitato un proficuo scambio di idee tra esperti e partecipanti, culminando nella redazione di un documento inviato al Ministero per i Beni e le Attività Culturali (MIC) per integrarlo nei materiali preparatori per la COP26. Il 30 settembre 2021, le richieste dei giovani sono state ascoltate dal Presidente della Repubblica Sergio Mattarella, dal Premier Mario Draghi e dal Primo Ministro britannico Boris Johnson durante l'apertura della conferenza ministeriale Pre-COP26.

La **Pre-COP26**, che ha coinvolto circa 400 giovani delegati provenienti da diverse nazioni, ha rappresentato un evento cruciale per alimentare il vertice Pre-COP di ottobre. I giovani partecipanti sono stati chiamati a sviluppare quattro pilastri fondamentali: *Youth Driving Ambition, A Climate-Conscious Society, Sustainable Recovery* e Engagement. La **COP26**, infine, conclusasi a Glasgow il 13 novembre, ha registrato notevoli progressi, inclusi un aumento degli impegni finanziari per aiutare i paesi in via di sviluppo e l'adozione di iniziative chiave come la riduzione delle emissioni di metano e l'elaborazione del Codice di Parigi. L'iniziativa *Youth4Climate* e l'attiva partecipazione dei giovani *leader* del clima hanno rappresentato una speranza e un'opportunità per il cambiamento, estendendo il loro contributo alle aree interne europee. Il loro impegno è stato cruciale per costruire un mondo più resiliente e mitigare gli effetti dei cambiamenti climatici, unendo governi, organizzazioni internazionali, società civile e giovani leader nella costruzione di un futuro sostenibile.

Fig. I.5.6.1 | Next Generation EU ©FIRST, 2022.

[1] Sostituisce il Ministero dell'Ambiente e della tutela del territorio e del mare. Ampio l'ambito di azione del nuovo dicastero, che assorbe, oltre a tutte le competenze dell'ex Ministero dell'Ambiente, anche alcune delle competenze chiave nel processo della transizione ecologica, inerenti principalmente il settore dell'energia.

[2] programma di partnership globale del Gruppo della Banca Mondiale dedicato a coinvolgere un pubblico diversificato attraverso campagne creative di comunicazione sul clima. Il suo obiettivo è accelerare e consolidare l'azione per il clima alla ricerca di un futuro sostenibile.

[3] Il FAI - Fondo per l'Ambiente Italiano ETS è una fondazione italiana senza scopo di lucro che opera grazie al sostegno di privati cittadini, aziende e istituzioni per la salvaguardia del patrimonio storico, artistico e paesaggistico italiano.

I.6 Normativa di riferimento italiana

L'impegno del governo italiano verso la rinascita delle aree interne si estende oltre la mera allocazione di fondi; esso è una dichiarazione di intenti volta a rinnovare e rivitalizzare i tessuti rurali, spesso trascurati. Il PNRR emerge come un faro guida, proponendo una visione olistica che non solo mira a contrastare lo spopolamento, ma a creare condizioni per una crescita economica sostenibile e una maggiore qualità della vita nelle regioni interne.

Il finanziamento di 1,8 miliardi di euro destinato alle aree interne italiane all'interno del PNRR sottolinea l'importanza di modernizzare e digitalizzare tali regioni. L'installazione di reti Wi-Fi ad alta velocità non è solo un passo verso la connettività globale, ma anche un potente mezzo per incoraggiare l'innovazione, la formazione e la partecipazione attiva delle comunità rurali nell'economia digitale. L'adozione di sistemi di mobilità sostenibile, promossi tramite questo piano, contribuirà a migliorare la connettività tra villaggi, stimolando al contempo il turismo locale e sostenibile.

Il PSRN - Piano di Sviluppo Rurale Nazionale, con il suo finanziamento di 1,5 miliardi di euro, è un importante complemento, affrontando aspetti chiave come l'innovazione agricola, la creazione di posti di lavoro e l'attrazione turistica. La creazione di nuove imprese agricole rappresenta un investimento nel futuro delle comunità rurali, contribuendo non solo alla sicurezza alimentare ma anche alla crescita economica. L'attenzione alla trasformazione e commercializzazione dei prodotti agricoli potenzia il ruolo di queste aree nel panorama nazionale, promuovendo la loro identità unica e stimolando l'economia locale.

La Legge di Bilancio 2023 con il suo finanziamento aggiuntivo di 100 milioni di euro per gli Smart Villages è un ulteriore passo avanti. L'installazione di pannelli solari e fotovoltaici negli edifici pubblici non solo promuove la sostenibilità ambientale, ma crea anche nuove opportunità di occupazione e riduce la dipendenza dalle fonti energetiche tradizionali. La promozione della mobilità sostenibile e la creazione di centri di formazione e innovazione offrono un terreno fertile per lo sviluppo di competenze e iniziative locali.

Osservare il contesto europeo e le aree interne che hanno già tratto beneficio da fondi simili fornisce una prospettiva preziosa per l'Italia. La diversità di approcci e il successo di tali strategie mostrano come un impegno a lungo termine e una visione integrata siano essenziali per la rinascita delle aree interne.

L'Italia sta adottando una strategia ambiziosa e completa per garantire che le sue aree interne non solo superino le sfide dello spopolamento, ma diventino centri di innovazione, sostenibilità e prosperità. Questi investimenti rappresentano un investimento nel futuro del paese, preservando e valorizzando l'eredità culturale e naturale delle regioni interne. La via intrapresa sembra promettere un futuro in cui le comunità rurali sono non solo sopravvissute ma prosperano, contribuendo attivamente alla crescita complessiva dell'Italia.

Nei paragrafi successivi saranno esaminate con attenzione le diverse iniziative che si propongono di sostenere lo sviluppo, il recupero e la valorizzazione delle aree interne italiane, prendendo spunto dai paradigmi europei.

In primo luogo, sarà esaminato il pilastro della Strategia Nazionale per le Aree Interne (SNAI), che costituisce il fondamento di tutto il contesto tematico in oggetto. Successivamente, il Piano Nazionale di Ripresa e Resilienza (PNRR), che in risposta all'evento pandemico, ha assunto un ruolo centrale nella definizione di strategie per il rilancio e lo sviluppo di tali regioni.

Oltre a questi programmi centrali, l'analisi di una serie di interventi più specifici, per promuovere la rinascita dei luoghi più suggestivi del nostro Paese. In questo contesto, verrà esplorato il Piano Nazionale per la Riqualificazione dei Piccoli Comuni, un'iniziativa chiave che mira a rivitalizzare le piccole comunità, preservando al contempo il loro patrimonio culturale e storico. La Strategia Nazionale per le Aree Montane (SNAMI), nata con l'obiettivo di sostenere i territori montani, spesso svantaggiati, per garantirne la sostenibilità economica e ambientale.

La Strategia Nazionale per l'Adattamento ai Cambiamenti Climatici (SNAC), che ha lo scopo di adottare strategie efficaci in risposta alle sfide climatiche in rapida evoluzione. Infine, sarà esaminato il Piano di Azione e Coesione (PAC), un programma significativo che mira a garantire una coesione equa e sostenibile tra le diverse regioni del Paese e le iniziative regionali intraprese per le piccole comunità rurali considerando il caso studio siciliano delle Madonie.

Queste iniziative, prese nel loro insieme, delineano un quadro complesso, ma ben articolato di interventi mirati, tutti finalizzati a sostenere la rigenerazione delle aree interne italiane. Attraverso l'analisi di tali programmi, si potrà comprendere appieno l'impegno del governo italiano nella promozione dello sviluppo sostenibile, della resilienza e della valorizzazione delle ricchezze presenti in queste affascinanti regioni.

Fig. I.6.1 | Una rappresentazione delle aree rurali in Italia divise in urbane e periurbane, ad agricoltura intensiva e specializzata, rurali intermedie e con problemi di sviluppo ©Rete rurale, 2014.

I.6.1 SNAI - Strategia Nazionale per le Aree Interne

La Strategia Nazionale per le Aree Interne[1], nota come SNAI (*Fig. 1*) , costituisce una politica di sviluppo e coesione territoriale adottata a livello nazionale, mirata a contrastare il fenomeno di marginalizzazione e spopolamento nelle regioni interne del nostro Paese. Questo ambizioso progetto ha introdotto nuove forme di *governance*, adottando un approccio integrato a livello locale, al fine di promuovere lo sviluppo delle aree marginali caratterizzate da svantaggi geografici e demografici.
L'obiettivo principale della SNAI, proprio per andare incontro a questi problemi e trovare soluzioni, contrasta il declino demografico e fermare l'"emorragia demografica" che affligge queste zone. La SNAI ha selezionato 72 aree italiane, 1.077 comuni e circa 2.072.718 abitanti (*Fig. 2*).

Queste, per il periodo di programmazione 2014-2020, includono 1.060 comuni con circa 2 milioni di abitanti (dati ISTAT del 2020). Queste aree si estendono su un territorio di circa 51.000 kmq e rappresentano il 13,4% di tutti i comuni italiani e il 26% dei comuni classificati come aree interne. Inoltre, costituiscono il 3,4% della popolazione nazionale e il 15,5% della popolazione residente nei comuni classificati come aree interne. Occupano anche il 17% di tutta la superficie nazionale e il 28,4% della superficie totale di tutte le aree interne italiane. Le risorse nazionali allocate a queste aree ammontano a oltre 591 milioni di euro, a cui si aggiungono gli stanziamenti provenienti dai Fondi SIE[1] e da altri fondi pubblici e privati, al fine di contrastare lo spopolamento delle aree interne e promuovere la coesione sociale.

Le azioni di attuazione si concentrano su due principali ambiti all'interno dei comuni delle Aree Interne: i servizi essenziali e lo sviluppo locale. Per quanto riguarda i servizi essenziali, i progetti mirano a migliorare la qualità e la quantità dei servizi di istruzione, salute e mobilità. Gli interventi di sviluppo locale, invece, si concentrano sulla tutela del territorio e delle comunità locali, sulla valorizzazione delle risorse naturali e culturali, sul sostegno ai sistemi agroalimentari e allo sviluppo locale, sul risparmio energetico e sulle filiere locali di energie rinnovabili e artigianato.

La SNAI ha, inoltre, previsto una serie di azioni per promuovere la collaborazione tra le diverse aree interne, tra cui la creazione della Rete delle Aree Interne, una piattaforma di cooperazione tra le diverse aree interne italiane con l'obiettivo di promuovere la condivisione di esperienze e la collaborazione tra le aree, al fine di rafforzare le loro capacità di sviluppo. Inoltre, sono stati finanziati una serie di progetti pilota per testare nuove soluzioni per lo sviluppo delle aree interne. La Rete delle Aree Interne ha parzialmente contribuito alla collaborazione tra le aree interne e al rafforzamento delle loro capacità di sviluppo, ma ancora c'è molto da dover fare.

[1] Fondi strutturali e di investimento europei (fondi SIE) rappresentano il principale strumento della politica di investimento dell'Unione Europea. I fondi SIE comprendono cinque fondi: il Fondo europeo di sviluppo regionale (FESR), il Fondo sociale europeo (FSE), il Fondo di coesione (FC), il Fondo europeo agricolo per lo sviluppo rurale (FEASR) e il Fondo europeo per gli affari marittimi e la pesca (FEAMP). L'Italia, insieme ad altri 19 paesi dell'UE, beneficerà inoltre dell'iniziativa per l'occupazione giovanile (IOG).

Strategia Aree Interne

Fig. I.6.1.1 | Logo SNAI ©Agenzia per la coeasione territoriale, 2020.

Fig. I.6.1.2 | Photo by Stefano Intintoli on Unsplash - https://unsplash.com/photos/l4Q2mRL1o2I ©ForumPa, 2020.

1 Val Bormida
2 Val di Lanzo
3 Val d'Ossola
4 Valli Maira e Grana
5 Bassa Valle
6 Grand Paradis
7 Alta Valtellina
8 Alto Lago di Como e Valli del Lario
9 Appennino Lombardo - Oltrepo Pavese
10 Valchiavenna
11 Tesino
12 Val di Sole
13 Agordino
14 Comelico
15 Contratto di Foce - Delta del Po
16 Spettabile Reggenza
17 Alta Carnia
18 Canal del Ferro - Val Canale
19 Dolomiti Friulane
20 Alta Valle Arroscia
21 Antola-Tigullio
22 Beigua SOL
23 Val di Vara
24 Alta Valmarecchia
25 Appennino Emiliano
26 Appennino Piacentino Parmense
27 Basso Ferrarese
28 Casentino - Valtiberina
29 Garfagnana-Lunigiana
30 Valdarno e Valdisieve, Mugello, Val Bisenzio
31 Nord - Est Umbria
32 Sud Ovest Orvietano
33 Val Nerina
34 Appennino Basso Pesarese e Anconetano
35 Alto Maceratese
36 Piceno
37 Alta Tuscia Antica Città del Castro
38 Monti Reatini
39 Monti Simbruini
40 Valle del Comino
41 Alto Aterno - Gran Sasso Laga
42 Basso Sangro - Trigno
43 Subequana
44 Valfino-Vestina
45 Valle del Giovenco - Valle Roveto
46 Alto Medio Sannio
47 Fortore
48 Matese
49 Matese
50 Alta Irpinia
51 Cilento Interno
52 Tammaro - Titerno
53 Vallo di Diano
54 Alta Murgia
55 Gargano
56 Monti Dauni
57 Sud Salento
58 Alto Bradano
59 Marmo Platano
60 Mercure Alto Sinni Val Sarmento
61 Montagna Materana
62 Grecanica
63 Ionico - Serre
64 Reventino - Savuto
65 Sila e Presila
66 Calatino
67 Madonie
68 Nebrodi
69 Terre Sicane
70 Val Simeto
71 Alta Marmilla
72 Gennargentu - Mandrolisai

Fig. I.6.1.3 | Mappa delle 72 aree italiane della SNAI. ©Dipartimento per le politiche di coesione, 2014.

Le aree interne italiane si concentrano principalmente nell'entroterra e lungo la fascia appenninica, caratterizzandosi per una distribuzione prevalente nelle regioni del centro-sud del Paese. Queste aree, spesso marginalizzate rispetto ai centri urbani principali, comprendono territori montuosi e collinari, dove la densità di popolazione è inferiore e l'accesso ai servizi risulta più difficoltoso. Lungo la catena appenninica, in particolare, si trovano numerosi comuni che, pur essendo ricchi di patrimoni naturali, culturali e storici, affrontano sfide legate all'isolamento geografico, alla difficoltà di mobilità e alla carenza di infrastrutture. Le aree interne del centro-sud Italia includono vaste zone della Calabria, della Sicilia, della Campania, della Puglia, dell'Abruzzo, del Molise e della Basilicata, che costituiscono un importante bacino di tradizioni locali e identità culturale, ma che spesso soffrono di un invecchiamento della popolazione, di una bassa offerta di servizi e di opportunità di lavoro. La situazione è ancora più accentuata nelle zone ultraperiferiche, che vedono un progressivo spopolamento e una crescente difficoltà nell'attrarre investimenti. Tuttavia, queste aree, se adeguatamente valorizzate e sostenute da politiche di sviluppo, possono rappresentare un'opportunità per la crescita economica e sociale, grazie al loro patrimonio rurale, naturale e culturale.

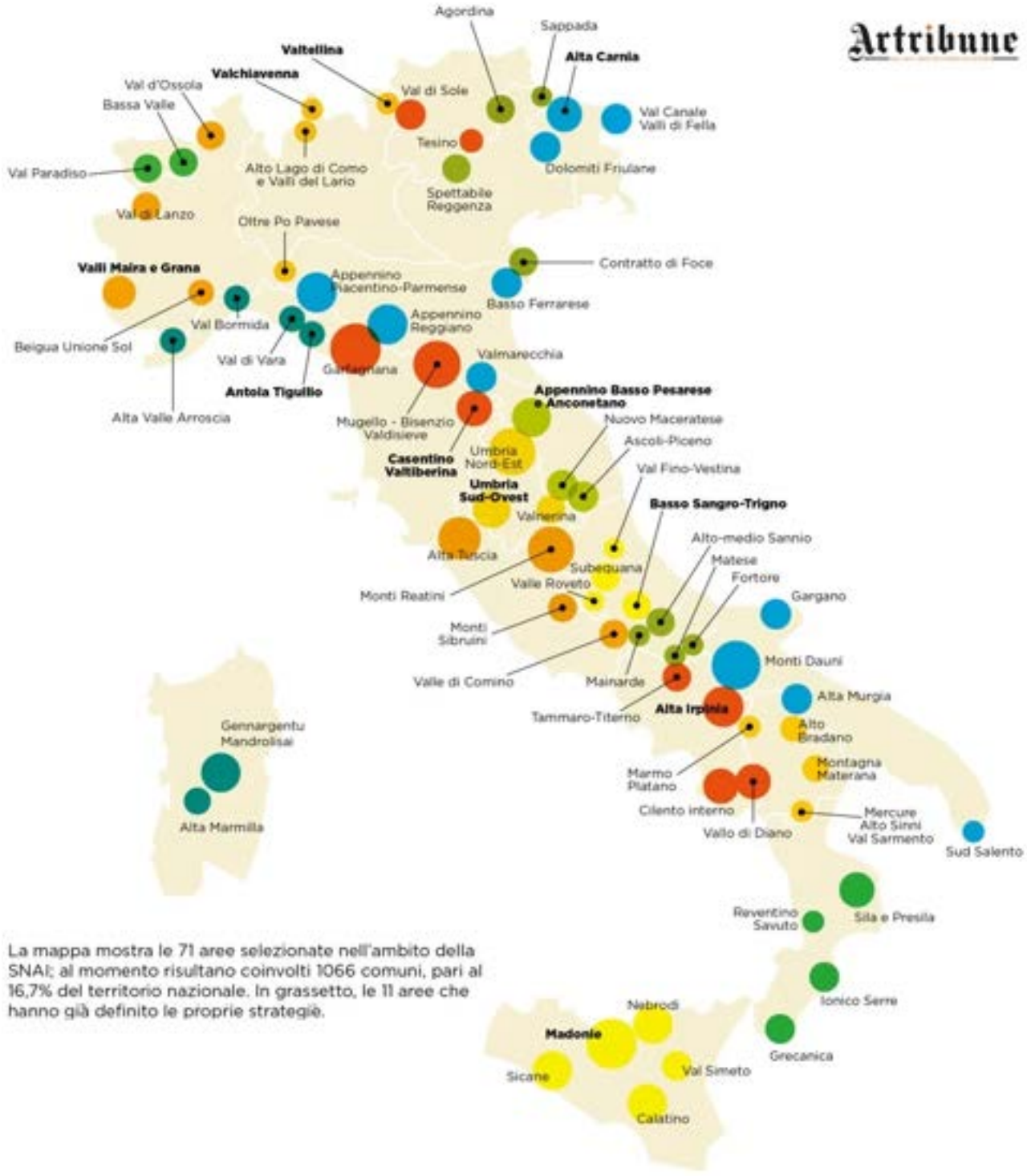


Fig. I.6.1.4 | Spopolamento e aree interne. Dati SNAI. Grafica ©Alessandro Naldi , 2020.

La mappa mostra le 71 aree selezionate nell'ambito della SNAI; al momento risultano coinvolti 1066 comuni, pari al 16,7% del territorio nazionale. In grassetto, le 11 aree che hanno già denifito le proprie strategie.

I.6.2 PNRR - Piano Nazionale di Ripresa e Resilienza

La pandemia ha colpito l'Italia corroborando una crisi economica, sociale e ambientale già in atto. Già prima del Covid-19 il nostro Paese arrancava rispetto alle altre nazioni europee avanzate, con problemi di produttività, un tessuto produttivo frammentato e una scarsa propensione all'adozione di nuove tecnologie, tanto nel settore privato quanto nella Pubblica Amministrazione. Il Next Generation EU (NGEU), meglio noto in Italia con il nome di "Recovery Fund" ha previsto una serie di fondi per risollevare le sorti degli Stati membri in seguito alla crisi provocata dalla pandemia. Per accedere ai fondi l'Italia, così come ciascun Stato membro, ha dovuto presentare il suo pacchetto di investimenti e riforme, vale a dire il Piano Nazionale di Ripresa e Resilienza (PNRR); investimenti e riforme articolato in sei missioni per 191,5 miliardi di euro suddivisi in:

- digitalizzazione, innovazione, competitività e cultura: 40,32 miliardi di euro;
- rivoluzione verde e transizione ecologica: 59,47 miliardi di euro;
- infrastrutture per una mobilità sostenibile: 25,40 miliardi di euro;
- istruzione e ricerca: 30,88 miliardi di euro;
- inclusione e coesione: 19,81 miliardi di euro;
- salute: 15,63 miliardi di euro.

Digitalizzazione, innovazione, competitività e cultura: promuovere l'innovazione digitale per sostenere l'infrastruttura del paese e la trasformazione dei processi produttivi delle imprese, con particolare attenzione alla Transizione 4.0 e ai progetti innovativi per le filiere del Made in Italy. Questi progetti sono accompagnati da una riforma sulla proprietà industriale volta a definire una strategia pluriennale per promuovere la cultura dell'innovazione e gli strumenti di protezione e valorizzazione della proprietà industriale. La riforma, avviata dal ministro Giorgetti, ha destinato risorse per 30 milioni di euro.

Rivoluzione verde e transizione ecologica: promuovere la transizione verde del paese puntando sull'energia prodotta da fonti rinnovabili, aumentando la resilienza ai cambiamenti climatici, sostenendo la ricerca e l'innovazione e incentivando il trasporto pubblico sostenibile.

Di questi fondi, 1,25 miliardi di euro sono stati stanziati per potenziare gli investimenti nelle principali filiere della transizione ecologica, mentre 1 miliardo di euro è stato destinato agli investimenti nelle fonti rinnovabili e nelle batterie per i settori industriali fotovoltaico, eolico e delle batterie. Tra le principali azioni previste ci sono la creazione di una *Gigafactory* per la produzione di pannelli fotovoltaici innovativi ad alto rendimento, la costruzione di uno stabilimento industriale per la produzione di pannelli flessibili per l'eolico e la costruzione di una *Gigafactory* "ultra-moderna" nel settore delle batterie.

Inoltre, è stato previsto un investimento di 250 milioni di euro per sostenere la crescita delle *startup* innovative attraverso la creazione di un *Green Transition Fund* (GTF) rivolto ai settori delle energie rinnovabili, dell'economia circolare, della mobilità, dell'efficienza energetica, dello smaltimento dei rifiuti e dello stoccaggio dell'energia.

Istruzione e ricerca: La ricerca e lo sviluppo mirano a incrementare l'interazione tra il mondo delle imprese e gli enti pubblici, migliorando la propensione all'innovazione delle piccole e medie imprese e la loro partecipazione a filiere strategiche per la competitività nazionale ed europea. Il PNRR e i fondi complementari forniscono 3,35 miliardi di euro, suddivisi come segue:

- Finanziamento al Fondo IPCEI: 1,5 miliardi di euro;
- Horizon Europe: 200 milioni di euro;
- Finanziamento al Fondo Nazionale per l'Innovazione: 300 milioni di euro;
- Rifinanziamento ed estensione tematica dei Centri di Trasferimento Tecnologico: 350 milioni di euro.

A questi si aggiunge un miliardo di euro per finanziare gli Accordi per l'innovazione.

Inclusione e coesione: Con un finanziamento di 400 milioni di euro, il piano prevede anche il rafforzamento e l'avvio di una nuova imprenditorialità femminile. Inoltre, è stato potenziato il "Fondo Impresa Donna" con una legge di Bilancio 2021, che prevedeva un finanziamento iniziale di 40 milioni di euro.

Circa 66 miliardi di euro per gli investimenti affidati alla gestione dei territori, di cui 20 miliardi al Mezzogiorno, a cui si aggiungono 9 miliardi di euro del programma React-EU, 54 miliardi di euro dei Fondi strutturali europei e 58 miliardi di euro del Fondo di sviluppo e coesione.

Per supportare l'azione di comuni, province, città metropolitane e regioni, il governo ha messo in campo una serie di strumenti soprattutto per il Mezzogiorno e agli organi delle amministrazioni locali. Sono previste figure tecniche specifiche per fornire assistenza nelle diverse fasi di programmazione e realizzazione delle opere. Gli strumenti a disposizione includono:

- **assunzioni specifiche/1:** i comuni avranno l'opportunità di assumere personale non dirigenziale con un fondo apposito di 30 milioni di euro all'anno fino al 2026, per il contenimento delle spese dei comuni con meno di 5.000 abitanti;
- **assunzioni specifiche/2:** opportunità ulteriore per assumere altro personale a tempo indeterminato per la realizzazione dei progetti del PNRR;
- **concorso SUD:** reclutamento di altre 2.022 unità per supportare le amministrazioni impegnate nel Sud per l'attuazione delle politiche di coesione nazionali ed europee, con criteri più favorevoli per i giovani laureati;
- **mille posti per attività amministrative:** le regioni possono stipulare mille incarichi di collaborazione con professionisti ed esperti per supportare i procedimenti amministrativi legati all'attuazione del PNRR, di cui il 40% è riservato al Sud;
- **nuove forze al Sud:** contratti di collaborazione con personale specializzato e professionisti;
- **risorse dai fondi strutturali europei:** possibilità di utilizzare risorse dei Programmi Operativi Complementari (POC) per supporto tecnico e operativo;
- **consulenze a esperti nelle grandi città:** i comuni con più di 250.000 abitanti possono stipulare incarichi di consulenza e collaborazione con esperti qualificati per accelerare i progetti;
- **aiuti ai grandi comuni in "predissesto":** possibilità per i comuni con più di 250.000 abitanti di potenziare l'organico degli uffici alle dipendenze del sindaco;
- **fondo per concorsi di idee e progetti:** possibilità per i comuni fino a 30.000 abitanti di indire concorsi di idee e progetti nell'ambito dell'urbanistica e dell'innovazione sociale o di impegnare tali risorse per studi di fattibilità tecnica ed economica;
- **supporto tecnico delle società pubbliche statali:** esperti qualificati per supporto tecnico-operativo da parte di Consip, Invitalia, Difesa Servizi e Sogei;
- **servizi di supporto per le stazioni appaltanti:** formazione del personale da parte di Consip;
- **convenzione con cassa depositi e prestiti;**
- **task force per l'edilizia scolastica.**

Salute: investimenti per rafforzare il sistema sanitario, migliorare la prevenzione, la gestione delle emergenze sanitarie e promuovere l'innovazione nel settore della salute. Ciò include progetti per potenziare le infrastrutture sanitarie, digitalizzare i servizi sanitari, migliorare la formazione del personale sanitario e promuovere la ricerca scientifica nel campo della salute.

Per finanziare ulteriori interventi, il governo italiano ha approvato poi un fondo aggiuntivo di 30,6 miliardi di euro, portando il totale a 222,1 miliardi

di euro. Il Ministero dello Sviluppo Economico (MISE) è responsabile di dieci progetti di investimento e un progetto di riforma. Ogni progetto è stato progettato per seguire le "Raccomandazioni specifiche" della Commissione europea e allo stesso tempo rafforzare il potenziale di crescita del paese.

La proposta di PNRR si concentra sui tre assi di intervento condivisi a livello europeo: digitalizzazione e innovazione, transizione ecologica e inclusione sociale. Stando alle stime contenute nello stesso Piano, il Governo prevede entro il 2026 un aumento del PIL di 3,6 punti percentuali e aumento dell'occupazione dei 3,2 punti percentuali. Il Piano si struttura in quattro aree:

- obiettivi generali;
- riforme e Missioni;
- attuazione e monitoraggio;
- valutazione dell'impatto macroeconomico.

Andando più nel dettaglio, il PNRR si sviluppa lungo 16 Componenti, funzionali a realizzare gli obiettivi economico-sociali definiti nella strategia del Governo. Tali componenti sono raggruppate in 6 Missioni, per ognuna delle quali sono indicate le riforme necessarie a una più efficace realizzazione degli interventi.

Per prepararsi all'attuazione del PNRR, il Ministero della Cultura (MiC) ha organizzato internamente l'individuazione di un'unità di missione a livello dirigenziale all'interno delle amministrazioni centrali. Questa unità è delegata a comunicare con l'Unità di Coordinamento della Presidenza del Consiglio e con l'Unità Centrale di *Governance* del Piano presso il Ministero dell'Economia e delle Finanze (MEF). Inoltre, è presente, nell'attività di tutela e valorizzazione del patrimonio costruito la Soprintendenza Speciale per il PNRR, che sarà responsabile della tutela dei beni culturali e paesaggistici interessati dagli interventi del piano di ripresa, sottoposti a Valutazione di Impatto Ambientale (VIA) a livello statale o che rientrino nel territorio di almeno due uffici periferici del Ministero (DPCM 6/2021). Questa Soprintendenza, indicata come Direzione Generale, è affidata al Direttore Generale per l'Archeologia, le Belle Arti e il Paesaggio (ABAP) del Ministero della Cultura (MiC) ed è dotata di una Segreteria Tecnica. Sessantatre riforme in tutto, che è possibile suddividere nelle seguenti tipologie:

- **riforme orizzontali** (o di contesto), innovazioni strutturali dell'ordinamento volte a migliorare l'equità, l'efficienza, la competitività e il quadro economico del Paese;
- **riforme abilitanti**, funzionali a garantire l'attuazione del Piano e in generale a rimuovere gli ostacoli amministrativi, regolatori e procedurali che condizionano le attività economiche e la qualità dei servizi erogati;
- **riforme settoriali** (contenute nelle singole Missioni), innovazioni normative relative a specifici ambiti di intervento o attività economiche, destinate a introdurre regimi regolatori e procedurali più efficienti nei rispettivi ambiti settoriali;
- **riforme concorrenti**, cioè misure non comprese direttamente nel Piano, ma necessarie alla realizzazione degli obiettivi generali del PNRR (come, ad esempio, la riforma fiscale o il potenziamento del sistema di ammortizzatori sociali).

I.6.2.1 Iniziative e opportunità del PNRR

Innovazione Digitale in Italia

Il Piano Nazionale per la Ripresa e Resilienza definisce obiettivi e interventi trasversali ai vari ambiti della sfera economica e sociale italiana. Dal Turismo alla Cultura, dall'Agricoltura alla Logistica, dall'Istruzione al Lavoro, dalla Sanità alla Pubblica Amministrazione. Minimo comun denominatore, all'interno delle Riforme e Missioni definite all'interno del Piano, è l'innovazione Digitale. Il Piano dedica al digitale un'intera missione (Missione 1) delle sei in cui è strutturato. Oltre 40 miliardi di euro, a cui si sommano le iniziative di digitalizzazione presenti in altre missioni, per un valore complessivo che supera i 65 miliardi di euro.

PNRR e Digitalizzazione Della PA
La PA riveste un ruolo di primo piano nell'attuazione del PNRR. Basti pensare come il 60% delle risorse associate al Piano siano destinate a PA centrali (ad esempio INPS), PA locali (ad esempio Comuni) o imprese pubbliche (es. Trenitalia) e come tutte le risorse dello stesso siano gestite da Ministeri o Dipartimenti della Presidenza del Consiglio, ergo PA. Il PNRR dedica alla Pubblica Amministrazione un'intera componente della Missione 1, quella appunto intitolata alla Transizione digitale delle PA. In questo ambito sono previste diverse riforme e investimenti volte a portare a compimento molte iniziative già avviate con il Piano Triennale e ad accelerare su alcuni fronti storicamente carenti come la migrazione Cloud dei servizi pubblici, competenze digitali e semplificazione dei processi amministrativi e giudiziari.

PNRR e Sanità
La Missione 6 del PNRR dedica al tema della Salute e Sanità un ampio capitolo di riforme e investimenti volti in particolare a rafforzare e sviluppare le reti e i presidi territoriali, nonché le competenze digitali nel rapporto medico-paziente e il ricorso a strumenti quali il Fascicolo Sanitario Elettronico e la Telemedicina. Si tratta di un unicuum nella storia degli investimenti e del cambiamento della Sanità Italiana per innovare il Sistema Sanitario Nazionale.

PNRR e Turismo
Tra i numerosi settori economici coinvolti dal PNRR, il turismo costituisce una delle principali aree di intervento, con investimenti volti a migliorare le strutture, i servizi e l'offerta. La Missione 1, incentrata sul tema della transizione digitale del sistema produttivo italiano, mira a a rilanciare il turismo e la cultura tramite l'assegnazione di 2,4 miliardi di euro. Digitalizzazione, competitività e transizione verde: questi i principali obiettivi perseguiti dal PNRR.

PNRR e Settore primario
Tra i provvedimenti del PNRR, nella Missione 2 è incluso lo stanziamento di 5,2 miliardi di euro per il comparto agricolo a sostegno dell'innovazione tecnologica. In primo luogo, si prevede un ammodernamento nel comparto della meccanica agricola, trainante per il mercato dell'Agricoltura 4.0. A questo si aggiungono provvedimenti per l'innovazione tecnologica del comparto, una trasformazione che potrebbe fare la differenza per tutti gli attori coinvolti nella filiera agroalimentare.

PNRR e Mercato del lavoro
Sono diversi gli interventi e i processi di selezione e formazione dei dipendenti nella Pubblica Amministrazione; lo sviluppo di competenze digitali necessarie per sostenere la transizione verde e digitale, la riforma delle politiche attive del lavoro e della formazione professionale.

PNRR e Identità digitale
Nella Missione 1 dedicata a transizione digitale e competitività, il Piano prevede un'offerta integrata di servizi digitali mirati a ottimizzare i processi e ridurre i tempi della Pubblica Amministrazione e semplificare la vita di cittadini, imprese ed enti. In relazione all'identità digitale si prevede di rafforzare il sistema partendo da piattaforme esistenti (SPID e CIE), per poi convergere verso una nuova soluzione con una migliore user experience e che offra una maggiore accessibilità ai servizi digitali.

PNRR e Startup
Anche l'ecosistema delle startup è coinvolto dal piano PNRR, seppur in maniera limitata. Infatti, se da un lato sono previsti fondi per le startup e le venture capital attive nella transizione ecologica nel quadro della Missione

2, dall'altro il Piano sembra incentrato principalmente su altre tipologie di investimenti e riforme che riguardano principalmente la Pubblica Amministrazione.

PNRR e Space Economy
All'interno delle Missione 1 sono stati destinati 1,49 miliardi di euro dedicati alla *Space Economy*, il nuovo fenomeno di frontiera in cui si combinano le tecnologie spaziali e digitali per sviluppare opportunità tecnologie e di business. L'economia dello spazio abbraccia in realtà diverse missioni del PNRR. Ad esempio, le tecnologie spaziali possono contribuire significativamente alla rivoluzione verde e transizione ecologica auspicata nella Missione 2. Altre applicazioni, come il *tracking* satellitare, possono essere di aiuto per la mobilità sostenibile e logistica (Missione 3) o addirittura in ambito Salute e Telemedicina (Missione 6).

PNRR e Supply Chain Finance
Scandagliando le missioni 1, 2 e 3 troviamo interessanti opportunità anche per il mercato del *Supply Chain Finance*, l'insieme delle soluzioni innovative che consentono a un'impresa di finanziare il proprio Capitale Circolante. A beneficiare dei provvedimenti del PNRR, in particolare, tre soluzioni: *Equipment Finance*, Cessione Crediti Fiscali e *Deep Tier Finance*.

PNRR e Smart Building
Per rimanere al passo con il resto dell'Europa, il PNRR prevede di equipaggiare sempre più infrastrutture, in ambito pubblico e privato, con alti livelli di connettività, sfruttando anche le funzionalità di altre applicazioni tecnologiche, tra cui i sistemi IoT. Non solo sensoristica avanzata applicata ai processi produttivi, alla mobilità o alla logistica, ma interi ecosistemi connessi all'interno di abitazioni private ed edifici pubblici, spesso caratterizzati da strutture obsolete, con elevati costi di manutenzione e forti inefficienze in termini di consumi energetici. Trasformare queste strutture in veri e propri *Smart Building* come scuole, cinema, teatri.

PNRR e Smart City
Dall'efficienza energetica alla mobilità, dalla sicurezza alla riqualificazione degli spazi urbani, fino alla digitalizzazione degli enti locali: di pari passo con lo *Smart Building*, il PNRR permea in maniera trasversale anche il tema *Smart City* e *Smart Village*. Gli ambiti applicativi del Piano Nazionale di Ripresa e Resilienza che rientrano nella sfera di influenza delle città e dei villaggi intelligenti sono molteplici e il potenziale degli interventi è molto alto, seppur in gran parte ancora da districare. Elementi di *Smart City* sono presenti in almeno tre delle sei Missioni previste del PNRR, in particolar modo nella Missione 5, nel quale si parla di Piani Urbani Integrati, ma non solo.

Gli enti attuatori a livello ministeriale degli investimenti culturali previsti dal PNRR sono:

- **Investimento 1.1:** Strategia digitale e piattaforme per il patrimonio culturale - Istituto Centrale per la Digitalizzazione del Patrimonio Culturale - Digital Library;
- **Investimento 1.2:** Rimozione delle barriere fisiche e cognitive nei musei, biblioteche e archivi per consentire un accesso e una partecipazione più ampia alla cultura - Direzione Generale dei Musei;
- **Investimento 1.3:** Migliorare l'efficienza energetica di cinema, teatri e musei - per i cinema la Direzione Generale dei Musei, per i teatri e i cinema la Direzione Generale del Cinema e dell'Audiovisivo;
- **Investimento 2.1:** Attrattività dei Borghi - Servizio V - Contratti e Attuazione Programmi del Segretariato Generale;
- **Investimento 2.2:** Tutela e valorizzazione dell'architettura e del paesaggio rurale - Servizio V - Contratti e Attuazione Programmi del Segretariato Generale;
- **Investimento 2.3:** Programmi per valorizzare l'identità dei luoghi: par-

chi e giardini storici - Servizio V - Contratti e Attuazione Programmi del Segretariato Generale;

- **Investimento 2.4:** Sicurezza sismica nei luoghi di culto, restauro del patrimonio culturale del Fondo Edifici di Culto (FEC) e siti di restauro per le opere d'arte (Recovery Art) - per la sicurezza sismica la Direzione Generale Sicurezza del Patrimonio Culturale; per il restauro del patrimonio FEC, la Soprintendenza Speciale di Roma; per la Recovery Art, il Servizio V - Contratti e Attuazione Programmi del Segretariato Generale;
- **Investimento 3.1:** Sviluppo dell'industria cinematografica (Progetto Cinecittà) - Direzione Generale del Cinema e dell'Audiovisivo;
- **Investimento 3.2:** Capacità dei operatori del settore - Direzione Generale della Creatività Contemporanea.

INVESTIMENTO 2.1
ATTRATTIVITÀ DEI BORGHI

In virtù della specificità di questo elaborato di tesi, si andrà ad approfondire questo investimento relativo al contributo che il PNRR prevede per le piccole aree interne italiane. Nell'ambito degli investimenti del PNRR, il MiC ha pubblicato un avviso pubblico per "Proposte di intervento per la rigenerazione culturale e sociale dei piccoli borghi storici" finalizzato a promuo-

TAVOLA 1.1: COMPOSIZIONE DEL PNRR PER MISSIONI E COMPONENTI (MILIARDI DI EURO)

M1. DIGITALIZZAZIONE, INNOVAZIONE, COMPETITIVITÀ, CULTURA E TURISMO	PNRR (a)	React EU (b)	Fondo complementare (c)	Totale (d=(a)+(b)+(c))
M1C1 - DIGITALIZZAZIONE, INNOVAZIONE E SICUREZZA NELLA PA	9,75	0,00	1,40	11,15
M1C2 - DIGITALIZZAZIONE, INNOVAZIONE E COMPETITIVITÀ NEL SISTEMA PRODUTTIVO	23,89	0,80	5,88	30,57
M1C3 - TURISMO E CULTURA 4.0	6,68	0,00	1,46	8,13
Totale Missione 1	**40,32**	**0,80**	**8,74**	**49,86**
M2. RIVOLUZIONE VERDE E TRANSIZIONE ECOLOGICA	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M2C1 - AGRICOLTURA SOSTENIBILE ED ECONOMIA CIRCOLARE	5,27	0,50	1,20	6,97
M2C2 - TRANSIZIONE ENERGETICA E MOBILITA' SOSTENIBILE	23,78	0,18	1,40	25,36
M2C3 - EFFICIENZA ENERGETICA E RIQUALIFICAZIONE DEGLI EDIFICI	15,36	0,32	6,56	22,24
M2C4 - TUTELA DEL TERRITORIO E DELLA RISORSA IDRICA	15,06	0,31	0,00	15,37
Totale Missione 2	**59,47**	**1,31**	**9,16**	**69,94**
M3. INFRASTRUTTURE PER UNA MOBILITÀ SOSTENIBILE	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M3C1 - RETE FERROVIARIA AD ALTA VELOCITÀ/CAPACITÀ E STRADE SICURE	24,77	0,00	3,20	27,97
M3C2 - INTERMODALITÀ E LOGISTICA INTEGRATA	0,63	0,00	2,86	3,49
Totale Missione 3	**25,40**	**0,00**	**6,06**	**31,46**
M4. ISTRUZIONE E RICERCA	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M4C1 - POTENZIAMENTO DELL'OFFERTA DEI SERVIZI DI ISTRUZIONE: DAGLI ASILI NIDO ALLE UNIVERSITÀ	19,44	1,45	0,00	20,89
M4C2 - DALLA RICERCA ALL'IMPRESA	11,44	0,48	1,00	12,92
Totale Missione 4	**30,88**	**1,93**	**1,00**	**33,81**
M5. INCLUSIONE E COESIONE	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M5C1 - POLITICHE PER IL LAVORO	6,66	5,97	0,00	12,63
M5C2 - INFRASTRUTTURE SOCIALI FAMIGLIE, COMUNITÀ E TERZO SETTORE	11,17	1,28	0,34	12,79
M5C3 - INTERVENTI SPECIALI PER LA COESIONE TERRITORIALE	1,98	0,00	2,43	4,41
Totale Missione 5	**19,81**	**7,25**	**2,77**	**29,83**
M6. SALUTE	**PNRR (a)**	**React EU (b)**	**Fondo complementare (c)**	**Totale (d=(a)+(b)+(c))**
M6C1 - RETI DI PROSSIMITÀ, STRUTTURE E TELEMEDICINA PER L'ASSISTENZA SANITARIA TERRITORIALE	7,00	1,50	0,50	9,00
M6C2 - INNOVAZIONE, RICERCA E DIGITALIZZAZIONE DEL SERVIZIO SANITARIO NAZIONALE	8,63	0,21	2,39	11,23
Totale Missione 6	**15,63**	**1,71**	**2,89**	**20,23**
TOTALE	191,50	13,00	30,62	235,12

Tab. I.6.2.1.1 | Composizione del PNRR per missioni e componenti. ©PNRR, 2022.

vere progetti per la rigenerazione, valorizzazione e gestione del patrimonio culturale ricco di storia, arte, cultura e tradizioni presente nei piccoli centri minori italiani. Gli obiettivi mirano alla tutela del patrimonio culturale, alla rivitalizzazione sociale ed economica, al rilancio occupazionale e al contrasto allo spopolamento.

Questo avviso pubblico del 20 dicembre 2021 riguarda la Missione 1 - Digitalizzazione, innovazione, competitività e cultura, Componente 3 - Cultura 4.0 (M1C3), Misura 2 "Rigenerazione di piccoli siti culturali, patrimonio culturale, religioso e rurale", Investimento 2.1: "Attrattività dei borghi storici", finanziato dall'Unione Europea - NextGenerationEU.

Le componenti di questo avviso riguardano principalmente due linee d'intervento:

- **Linea d'intervento A:** realizzazione di 21 progetti di particolare rilievo e significato, con un importo di 20 milioni di euro ciascuno, selezionati dalle regioni e dalle province autonome.
- **Linea d'intervento B:** realizzazione di interventi locali di rigenerazione culturale e sociale in almeno 229 borghi storici.

I destinatari della Linea d'intervento B sono i piccoli comuni, singoli o aggregati (massimo 3), con una popolazione residente fino a 5.000 abitanti, in cui sia presente un borgo storico identificabile. Le risorse del PNRR, distribuite tra le regioni e le province, sono distribuite per il 40% nel Mezzogiorno e per il restante 60% nel Centro-Nord.

I.6.2.2 Investimento 2.1 "Attrattività dei borghi"

Investimento 2.1 – Attrattività dei borghi – Linea A

Nell'ambito dell'Investimento, ma per i comuni con più di 5.000 abitanti, e dunque più popolati, sono destinati 420 milioni di euro alla Linea A che sosterrà progetti pilota per la rigenerazione culturale, sociale ed economica dei borghi a rischio abbandono o abbandonati, tramite la realizzazione di un numero limitato di interventi di carattere esemplare, uno per ciascuna Regione o Provincia Autonoma per un totale di 21 in numero e 420 Milioni in budget. Ciascun intervento sarà di importo pari a 20 milioni di euro e finalizzato al rilancio economico e sociale di borghi disabitati o caratterizzati da un avanzato processo di declino e abbandono. I progetti prevedono l'insediamento di nuove funzioni, infrastrutture e servizi nel campo della cultura, del turismo, del sociale o della ricerca, come ad esempio scuole o accademia di arti e dei mestieri della cultura, alberghi diffusi, residenze d'artista, centri di ricerca e campus universitari, residenze sanitarie assistenziali (RSA) dove sviluppare anche programmi a matrice culturale, residenze per famiglie con lavoratori in *smart working* e nomadi digitali.

Per questa linea di azione, Regioni e Province autonome hanno presentato la propria proposta al MiC; è seguita poi una fase negoziale condotta da un Comitato tecnico istituito dal MiC al quale hanno partecipato un rappresentante delle Regioni, un rappresentante dell'ANCI e un rappresentante delle associazioni partecipanti al Comitato di coordinamento borghi. Il percorso negoziale, mirato alla verifica della coerenza delle proposte progettuali con i processi e le tempistiche attuative del PNRR, si è concluso con l'ammissione a finanziamento di 20 proposte:

- Abruzzo: Rocca Calascio (AQ)
- Basilicata: Monticchio Bagni (PZ)
- Calabria: Gerace (RC)
- Campania: Sanza (SA)
- Emilia-Romagna: Campolo (BO)
- Friuli-Venezia Giulia: Borgo Castello (GO)
- Lazio: Trevinano (VT)
- Liguria: Borgo Castello (SV)
- Lombardia: Livemmo (BS)
- Marche: Montalto delle Marche (AP)

- Piemonte: Elva (CN)
- Puglia: Accadia (FG)
- Sardegna: Ulassai (NU)
- **Sicilia: A Cunziria (CT)**
- Toscana: Borgo di Castelnuovo in Avane (AR)
- Umbria: Cesi (TR)
- Valle d'Aosta: Arvier (AO)
- Veneto: Recoaro Terme (VT)
- Provincia di Bolzano: Stelvio (BZ)
- Provincia di Trento: Palù del Fersina (TN)

Investimento 2.1 – Attrattività dei borghi – Linea B
L'Avviso era rivolto ai piccoli comuni singoli o aggregati con una popolazione residente fino a 5000 abitanti, nei quali era presente un borgo storico chiaramente identificabile e riconoscibile. Le aggregazioni di comuni potevano riguardare comuni limitrofi o comuni ricadenti nella stessa regione che condividevano tematiche simili. Nel caso di aggregazioni di più comuni, fino a un massimo di tre, in ogni comune doveva essere presente un borgo storico. Nel caso di comuni in forma aggregata, la candidatura doveva essere presentata dal Comune che assumeva il ruolo di proponente e capofila.
La Linea B, volta a sostenere Progetti locali per la Rigenerazione Culturale e Sociale, ha ricevuto un finanziamento totale di 580 milioni di euro. Inoltre, è stato destinato un importo di 20 milioni di euro all'intervento "Turismo delle radici," gestito dal Ministero degli Affari e della Cooperazione Internazionale.

Ha beneficiato di una dotazione finanziaria di 380 milioni di euro ed è stata finalizzata alla realizzazione di progetti in almeno 229 borghi storici, in coerenza con il target previsto dalla scheda relativa all'investimento 2.1 del PNRR-M1C3-Cultura. Successivamente, attraverso una procedura separata e con una dotazione finanziaria di 200 milioni di euro, sono state sostenute centralmente le imprese che operano in settori culturali, turistici, commerciali, agroalimentari e artigianali, localizzate nei medesimi comuni oggetto dei Progetti di rigenerazione culturale e sociale, sotto la responsabilità del MiC.

L'Avviso pubblico, dedicato ai piccoli borghi storici, ha avuto l'obiettivo di promuovere progetti per la rigenerazione, valorizzazione e gestione del ricco patrimonio di storia, arte, cultura e tradizioni presenti nei piccoli centri italiani. Questa iniziativa ha integrato gli obiettivi di tutela del patrimonio culturale con le esigenze di rivitalizzazione sociale ed economica, rilancio occupazionale e contrasto dello spopolamento.

Gli interventi ammissibili al finanziamento hanno dovuto contribuire al rinnovamento del tessuto socio-economico di questi luoghi mediante la riqualificazione degli spazi pubblici, la rigenerazione del patrimonio storico-architettonico e l'attivazione di iniziative imprenditoriali e commerciali in grado di generare occupazione nel territorio.

Tra i progetti finanziati dal PNRR, meritano menzione due iniziative che hanno contribuito in modo significativo all'innovazione.

Scuole innovative: Il progetto "Scuole innovative" del Ministero dell'Istruzione volto a riqualificare gli edifici scolastici e a dotarli di nuove tecnologie ha ricevuto un investimento di 1,5 miliardi di euro, utilizzato per la realizzazione di interventi di ristrutturazione, messa in sicurezza e dotazione di nuove tecnologie in 2000 scuole di tutta Italia. Tra i principali obiettivi del progetto migliorare la qualità dell'istruzione attraverso l'utilizzo di tecnologie innovative, come la didattica a distanza, la realtà virtuale e la realtà aumentata; rendere le scuole più sicure e accoglienti, con interventi di ristrutturazione e messa in sicurezza degli edifici e favorire l'inclusione e la partecipazione degli studenti con disabilità o difficoltà di apprendimento;
Progetto completato già in circa 500 scuole, mostra i primi risultati incoraggianti che evidenziano come le nuove tecnologie possono migliorare l'ap-

prendimento degli studenti e rendere le scuole più inclusive.

Energie rinnovabili: Il progetto "Energie rinnovabili" del Ministero della Transizione Ecologica mira a promuovere l'utilizzo di energie pulite e sostenibili. Un investimento di 19,4 miliardi di euro utilizzato per la realizzazione di impianti di produzione di energia solare, eolica e geotermica. Tra i principali obiettivi del progetto: ridurre la dipendenza dai combustibili fossili e ridurre le emissioni di gas serra; creare nuovi posti di lavoro nel settore delle energie rinnovabili e contribuire alla decarbonizzazione dell'economia italiana. Il progetto ha permesso la realizzazione di oltre 1000 nuovi impianti di produzione di energia rinnovabile che stanno contribuendo a ridurre la dipendenza dell'Italia dai combustibili fossili e a migliorare la qualità dell'aria. Questi sono solo alcuni esempi dei numerosi progetti e iniziative che sono stati realizzati o che sono in fase di realizzazione nell'ambito del PNRR.

I.6.2.3 PNRR Cultura: Valorizzazione dell'architettura e del paesaggio rurale

Nel contesto dei finanziamenti delineati dal PNRR[1], particolare attenzione è rivolta all'architettura rurale, con l'obiettivo di recuperare l'intero paesaggio, superando la limitata focalizzazione sui centri storici dei piccoli paesi dell'entroterra italiano e abbracciando il paesaggio inclusi i beni isolati.
L'importanza del recupero dell'architettura rurale riveste un ruolo cruciale nella realizzazione di una connessione armoniosa tra il centro storico e il paesaggio circostante. Una sinergia indissolubile di storia, ambiente e paesaggio antropico. Il concetto di paesaggio assume qui una valenza più ampia, caratterizzandosi come una fusione senza confini tra la natura e l'artificiale. La proposta promuove un processo sistematico di identificazione, conservazione e valorizzazione di un variegato patrimonio intesi come "borghi". Il principale obiettivo è preservare l'unicità del paesaggio rurale, contribuendo simultaneamente alla tutela del patrimonio culturale e allo stimolo dello sviluppo locale.

Le sfide affrontate sono molteplici:

- conservare gli elementi distintivi dei paesaggi storici rurali, con particolare attenzione alla specificità della distribuzione sparsa degli edifici; numerose strutture hanno subito abbandono e degrado, mettendo a rischio le caratteristiche tipologiche e il loro legame con gli spazi circostanti;
- ridurre le disparità regionali nel Paese, favorendo la creazione di occupazione e mitigando l'impatto sociale ed economico della crisi pandemica: l'intervento mira a rafforzare le economie rurali e a sostenere il turismo nelle aree interne, valorizzando le produzioni legate all'agricoltura e all'artigianato tradizionale, con particolare attenzione alle Madonie.

Oltre a generare occupazione nei settori agricolo e edile, la proposta agisce come misura anticiclica coinvolgendo operatori e professionisti specializzati nel recupero paesaggistico e architettonico, focalizzandosi sull'architettura vernacolare e sulla loro integrazione nel tessuto ambientale.

Gli obiettivi principali dell'investimento comprendono: preservare i valori dei paesaggi rurali storici all'interno di aree protette, proteggendo e valorizzando il patrimonio culturale, materiale e immateriale, e promuovendo pratiche agricole tradizionali essenziali per mantenere l'unicità del paesaggio e favorire iniziative legate a una fruizione turistico-culturale sostenibile, rispettando le tradizioni e la cultura locale e adattandole alle specificità locali. L'investimento complessivo ammonta a 600 milioni di euro, di cui 590 milioni sono destinati al finanziamento di interventi di recupero di insediamenti agricoli e fabbricati rurali storici, inclusi quelli sparsi e isolati nel territorio delle Madonie. I restanti 10 milioni sono destinati alle attività di censimento dei beni del patrimonio rurale e all'implementazione di sistemi informativi.

L'iniziativa, coordinata dal Ministero della Cultura, ha già conseguito

successi con numerosi interventi, sebbene i risultati ottenuti potrebbero essere stati più significativi. Questo passo riveste un'importanza notevole, specialmente considerando che, al di là dei pittoreschi borghi, il Sud Italia e la Sicilia ospita una serie di beni isolati nel paesaggio.

Questo incentivo non solo mira al recupero delle architetture rurali, ma rappresenta un prezioso alleato nel preservare e valorizzare un vasto patrimonio. L'iniziativa offre, dunque, un valore aggiunto al territorio, contribuendo a mantenere vive le tracce storiche e culturali che caratterizzano soprattutto i centri minori. La diversità e la diffusione di tali beni, sparsi nei territori, conferiscono un'ulteriore autenticità e fascino a questo angolo di Sicilia, rendendolo ancora più attraente per residenti e visitatori.

L'investimento si propone di valorizzare gli edifici storici rurali con l'obiettivo di incrementare l'afflusso turistico nelle aree periferiche del Paese, nonché di migliorare la tutela del paesaggio circostante. Attraverso il recupero di edifici abbandonati o in stato di vetustà, si prevede la creazione di nuovi posti di lavoro, la riduzione delle disparità regionali e il mitigare dell'impatto della crisi. Questo processo contribuirà, inoltre, a valorizzare l'artigianato locale e promuovere i prodotti agricoli della regione.

Questo investimento mira a promuovere un sistematico processo di valorizzazione di edifici storici rurali, appartenenti sia a privati che a enti del terzo settore, congiuntamente alla tutela del paesaggio. Numerosi edifici rurali e strutture agricole hanno subito un graduale processo di abbandono, degrado e alterazioni, compromettendo le loro caratteristiche distintive e il rapporto con gli spazi circostanti.

Attraverso il recupero del patrimonio edilizio rurale, l'intervento contribuirà al miglioramento della qualità paesaggistica del territorio nazionale, restituendo alla collettività un patrimonio edilizio sottoutilizzato e inaccessibile al pubblico.

Le implicazioni positive di questo intervento si rifletteranno sulle economie locali, promuovendo il turismo sostenibile nelle zone rurali e valorizzando la produzione legata al mondo agricolo e all'artigianato tradizionale.

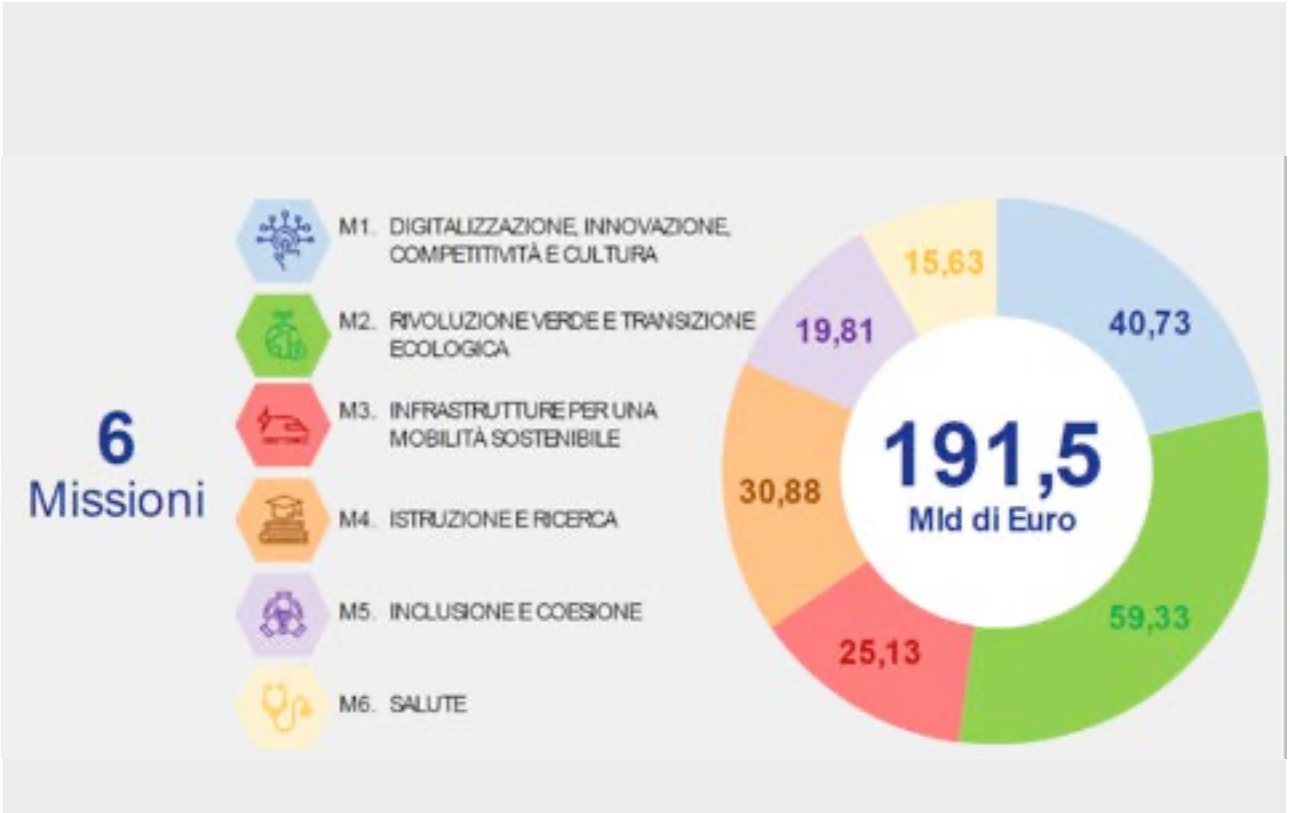


Fig. I.6.2.2.1 | Le sei missioni missioni principali del PNRR ©PNRR, 2022.

I.6.3 Piano Nazionale per la riqualificazione dei piccoli comuni

Il Piano Nazionale per la Riqualificazione dei Piccoli Comuni è un piano di investimento pubblico che mira a sostenere lo sviluppo sostenibile, l'equilibrio demografico, la tutela e la valorizzazione del patrimonio naturale, rurale, storico-culturale e architettonico, nonché il sistema dei servizi essenziali nei piccoli comuni italiani. Il piano è stato approvato dal Consiglio dei Ministri il 20 luglio 2022 e prevede un investimento complessivo di 1,3 miliardi di euro per il periodo 2022-2026. Un'iniziativa importante per sostenere lo sviluppo dei piccoli comuni italiani, che rappresentano una parte significativa del territorio e della popolazione nazionale. I beneficiari del piano sono i piccoli comuni italiani, individuati in base a un criterio di popolazione inferiore a 5.000 abitanti. I progetti devono essere presentati dai comuni singolarmente o in forma associata e i progetti finanziabili sono relativi a interventi di:

- rigenerazione urbana e valorizzazione del patrimonio immobiliare;
- promozione dello sviluppo economico e sociale;
- tutela e valorizzazione dell'ambiente;
- miglioramento dei servizi pubblici.

Tra i progetti che possono essere finanziati dal Piano:

- **riqualificazione di centri storici:** i progetti di riqualificazione di centri storici possono includere interventi per la conservazione e il restauro di edifici storici, la realizzazione di spazi pubblici e pedonali, la promozione di attività culturali e turistiche;
- **recupero di edifici pubblici abbandonati:** gli edifici pubblici abbandonati possono essere recuperati per ospitare attività sociali, culturali, economiche o per essere riconvertiti in abitazioni;
- **realizzazione di infrastrutture per la mobilità sostenibile:** le infrastrutture per la mobilità sostenibile, come piste ciclabili, sentieri escursionistici e trasporto pubblico locale, possono contribuire a migliorare la qualità della vita e a ridurre l'inquinamento;
- **promozione di attività turistiche e culturali:** le attività turistiche e culturali possono contribuire a creare posti di lavoro e a promuovere la crescita economica locale;
- **investimenti in agricoltura e sviluppo rurale:** gli investimenti in agricoltura e sviluppo rurale possono contribuire a preservare l'ambiente e a promuovere la produzione di cibo locale.

Il piano rappresenta un'opportunità per i piccoli comuni di migliorare la propria offerta di servizi e attrattività, in modo da attrarre nuovi residenti e attività economiche. Ben oltre i bandi nazionali promossi, *INVITALIA*[1], un'agenzia governativa italiana, si pone l'obiettivo di promuovere lo sviluppo economico e sociale del paese. Tra le sue varie iniziative, uno degli aspetti più importanti è il suo impegno nella promozione di bandi per la rivitalizzazione dei piccoli comuni italiani. Questi bandi sono progettati per fornire incentivi finanziari e supporto tecnico ai comuni che desiderano intraprendere progetti di rinascita e miglioramento delle loro comunità. Uno degli aspetti chiave di questo impegno è l'allocazione di fondi per progetti che riguardano infrastrutture, servizi pubblici, turismo, cultura e molto altro. Invitalia collabora con le autorità locali per identificare le esigenze specifiche dei piccoli comuni e sviluppare piani d'azione mirati. Questi piani mirano a migliorare la qualità della vita nei comuni, rendendoli luoghi più attraenti per i residenti e i visitatori. I bandi promossi spesso offrono opportunità di finanziamento e supporto tecnico per una vasta gamma di progetti. Questi progetti possono includere la riqualificazione di aree urbane, la promozione del turismo locale, lo sviluppo di iniziative culturali e la creazione di nuove imprese locali. L'obiettivo finale è quello di stimolare la crescita economica, creare posti di lavoro e preservare il patrimonio culturale italiano nei piccoli comuni.

[1]L'agenzia non solo offre risorse finanziarie, ma fornisce anche assistenza nell'elaborazione delle proposte di progetto e nella gestione dei finanziamenti assegnati. Questo supporto è cruciale per i piccoli comuni, che spesso possono avere risorse limitate e bisogno di aiuto per navigare nel complesso processo di accesso ai finanziamenti pubblici.

I.6.4 SNAMI - Strategia Nazionale per la Montagna Italiana

La Strategia Nazionale per la Montagna Italiana (SNAMI) è un'iniziativa finanziata attraverso il Fondo per lo sviluppo delle montagne italiane (FOSMIT). Questo fondo raccoglie le risorse del Fondo nazionale per la montagna e del Fondo integrativo per i Comuni montani, con uno stanziamento di 100 milioni di euro per il 2022 (rispetto ai precedenti 29,5 milioni) e di 200 milioni a partire dal 2023, come previsto dalla recente legge di bilancio. L'aumento significativo dei fondi garantirà la copertura delle misure agevolative previste. Questo è previsto da un disegno di legge approvato dal Consiglio dei Ministri per promuovere lo sviluppo delle zone montane del Paese. In particolare, sono previste forme di incentivi per medici e operatori socio-sanitari che lavorano nei comuni montani, così come viene riconosciuto l'accesso privilegiato alla posizione di direttore sanitario per i medici che hanno esercitato la loro attività nelle aree di montagna. Sono anche previste agevolazioni fiscali per gli operatori che prendono in affitto o acquistano immobili nei Comuni montani. Il Consiglio dei Ministri, su proposta dell'allora presidente Mario Draghi e del ministro per gli Affari regionali e le autonomie, Mariastella Gelmini, ha approvato il disegno di legge "Disposizioni per lo sviluppo e la valorizzazione delle zone montane" che introduce misure organiche volte a promuovere lo sviluppo economico e la ripresa di molte aree che avranno l'opportunità di diventare sempre più una risorsa per il Paese. Mira anche a contrastare lo spopolamento della montagna italiana, raccogliendo in un unico testo interventi normativi per ridurre le condizioni di svantaggio dei Comuni montani. Stabilisce, infine, i criteri per l'individuazione dei Comuni montani e disciplina i parametri aggiuntivi per accedere agli incentivi e al sostegno previsti.

Attraverso la SNAMI, il ministro per gli Affari regionali e le autonomie identifica le linee strategiche per la crescita e lo sviluppo economico e sociale, l'accessibilità ai servizi essenziali e alle infrastrutture digitali, nonché il pieno godimento dei diritti fondamentali nelle aree montane. Le misure adottate dal disegno di legge riguardano poi:

- **sanità di montagna:** sono previste forme di incentivo per i medici e gli operatori socio-sanitari che lavorano nei Comuni montani. In particolare, viene riconosciuto l'accesso privilegiato alla posizione di direttore sanitario per i medici che hanno svolto la loro attività nelle aree di montagna. Inoltre, viene riconosciuto un credito d'imposta per medici e operatori socio-sanitari che prendono in affitto o acquistano un immobile a uso abitativo nei Comuni montani beneficiari di tali agevolazioni;
- **scuole di montagna:** sono previste misure agevolative e incentivi per gli insegnanti che lavorano nelle aree montane. Vengono introdotte forme di incentivazione, anche in termini di punteggio di servizio, per i docenti a tempo determinato delle scuole di montagna di tutti i livelli. Ai docenti di montagna viene inoltre riconosciuto un credito d'imposta per l'abitazione, alle stesse condizioni previste per i medici e gli operatori socio-sanitari di montagna;
- **servizi di telefonia mobile e accesso a internet:** vengono incentivati il potenziamento dell'accesso a internet ad alta velocità e gli interventi sulle infrastrutture per garantire la continuità dei servizi di telefonia mobile. Vengono ulteriormente potenziate le misure previste dal Piano nazionale di ripresa e resilienza, coinvolgendo anche territori esclusi dal PNRR;
- **incentivi agli imprenditori agricoli e forestali:** viene riconosciuto un contributo, sotto forma di credito d'imposta, agli imprenditori agricoli e forestali che operano nei Comuni montani e investono in pratiche benefiche per l'ambiente e il clima. Le pratiche per gli imprenditori agricoli saranno individuate da un decreto del ministro delle Politiche agricole, alimentari e forestali, mentre per gli imprenditori forestali consistono nella diversificazione delle colture, nel mantenimento o nell'introduzione di aree di interesse ecologico e nel mantenimento dei prati permanenti;

- **misure fiscali a favore delle imprese montane "giovani":** viene introdotto un credito d'imposta per i primi tre periodi contabili, destinato alle piccole e microimprese che avviano la propria attività nei Comuni montani beneficiari di questa forma di agevolazione, e in cui il titolare o almeno uno dei proprietari non abbia compiuto 36 anni di età;
- **misura "Io resto in montagna":** questa misura mira a incentivare la residenza in montagna. Ai contribuenti di età inferiore ai 41 anni viene riconosciuta una detrazione fiscale superiore a quella ordinariamente prevista per gli interessi passivi pagati per i mutui contratti per l'acquisto dell'abitazione principale. La detrazione è valida nei Comuni montani con una popolazione residente non superiore a 2.000 abitanti beneficiari di questa forma di agevolazione.

Il programma denominato "Io Resto in Montagna" è stato presentato come parte del disegno di legge intitolato "Disposizioni per lo Sviluppo e la Valorizzazione delle Zone Montane", e approvato dal Consiglio dei Ministri in data 20 luglio 2022. Questa iniziativa ha l'obiettivo di incentivare la residenza nelle regioni montane, attraverso l'offerta di agevolazioni fiscali superiori rispetto a quelle normalmente previste per gli interessi passivi associati ai mutui contratti per l'acquisto di abitazioni principali nei Comuni montani con una popolazione residente non superiore a 2.000 abitanti. La detrazione fiscale offerta ammonta al 30% degli interessi passivi versati per i primi tre periodi contabili, con un limite massimo di 1.500 euro per ogni periodo contabile. Questa agevolazione fiscale può essere accumulata con altre agevolazioni previste per l'acquisto della prima casa.

Un'iniziativa di notevole rilevanza nel contrastare il fenomeno dello spopolamento che affligge le regioni montane. L'agevolazione fiscale costituisce un concreto incentivo per giovani e famiglie a scegliere di stabilirsi in queste zone, dove possono godere di un ambiente naturale unico e di un'atmosfera più tranquilla. Nonostante il progetto sia ancora in fase di implementazione, ha già suscitato notevole interesse. Secondo un sondaggio condotto dal Ministero per gli Affari Regionali e le Autonomie, il 40% dei giovani italiani manifesta interesse a vivere in zone montane.

"Io Resto in Montagna" rappresenta solo una delle misure previste all'interno della Strategia Nazionale per la Montagna Italiana (SNAMI) con l'obiettivo di contrastare lo spopolamento. Altre misure includono incentivi per medici e operatori socio-sanitari che operano in zone montane, agevolazioni fiscali per imprenditori agricoli e forestali, e finanziamenti destinati allo sviluppo delle infrastrutture.
L'implementazione della SNAMI rappresenta un'occasione di rilievo per revitalizzare le zone montane e renderle più attrattive per giovani e famiglie, contribuendo al benessere complessivo delle regioni montane italiane.

I.6.5 SNAC – Strategia Nazionale di Adattamento ai Cambiamenti Climatici

Il 30 ottobre 2014, il Ministero dell'Ambiente ha varato la Strategia Nazionale di Adattamento ai Cambiamenti Climatici (SNAC, MATTM 2015), un importante documento che fornisce una visione strategica nazionale su come affrontare gli impatti dei cambiamenti climatici così come definiti nella Strategia Europea di adattamento ai cambiamenti climatici del 2013, poi oggetto di modifica nel 2021. La Strategia è stata redatta dal Ministero dell'Ambiente e della Tutela del Territorio e del Mare[1] con il coordinamento scientifico del CMCC[2] e ha ottenuto il parere positivo della Conferenza Unificata.

La Strategia ha trovato nel Piano Nazionale di adattamento ai Cambiamenti Climatici lo strumento di attuazione e definizione a livello nazionale e territoriale. Delinea l'insieme di azioni e priorità volte a ridurre l'impatto dei cambiamenti climatici sull'ambiente, sui settori socio-economici e sui sistemi naturali del nostro Paese. Individua i principali impatti dei cambiamenti climatici sulle risorse ambientali e, su un insieme di settori socio-economici rilevanti a livello nazionale, indica per ciascuno di essi delle prime proposte di azioni di adattamento a tali impatti. Volto a ridurre al minimo i rischi derivanti dai cambiamenti climatici, proteggere la salute il benessere e i beni della popolazione, preservare il patrimonio naturale, mantenere o migliorare la resilienza e la capacità di adattamento dei sistemi naturali, sociali ed economici nonché trarre vantaggio dalle eventuali opportunità che si potranno presentare con le nuove condizioni climatiche.

Per realizzare il suo obiettivo, definisce le seguenti azioni: migliorare le attuali conoscenze sui cambiamenti climatici e sui loro impatti; descrivere la vulnerabilità del territorio, le opzioni di adattamento per tutti i sistemi naturali ed i settori socio-economici rilevanti, e le opportunità eventualmente associate; promuovere la partecipazione ed aumentare la consapevolezza dei portatori di interesse nella definizione di strategie e piani di adattamento settoriali attraverso un ampio processo di comunicazione e dialogo, anche al fine di integrare l'adattamento all'interno delle politiche di settore in maniera più efficace; supportare la sensibilizzazione e l'informazione sull'adattamento attraverso una capillare attività di comunicazione sui possibili pericoli, i rischi e le opportunità derivanti dai cambiamenti climatici; specificare gli strumenti da utilizzare per identificare le migliori opzioni per le azioni di adattamento, evidenziando anche i co-benefici.

Oltre a rappresentare un quadro di riferimento per l'adattamento per le Regioni e le municipalità fornisce obiettivi, principi ed un set di azioni settoriali ed intersettoriali di adattamento (settori come risorse idriche, agricoltura, salute, trasporti, energia, ecc.). Si tratta di un passo in avanti verso uno sviluppo sostenibile del Paese, con nuovi strumenti per prevenzione e gestione dei rischi dei cambiamenti climatici nei settori chiave del nostro Paese e per creare valore aggiunto dalla conoscenza sui cambiamenti climatici.

Nella Strategia Nazionale l'obiettivo generale dell'adattamento è declinato in quattro obiettivi specifici riguardanti: il contenimento della vulnerabilità dei sistemi naturali, sociali ed economici agli impatti dei cambiamenti climatici; l'incremento della capacità di adattamento degli stessi; il miglioramento dello sfruttamento delle eventuali opportunità; il coordinamento delle azioni a diversi livelli. A supporto alla "Strategia Nazionale di Adattamento ai cambiamenti climatici" i seguenti documenti: "Rapporto sullo stato delle conoscenze scientifiche su impatti, vulnerabilità ed adattamento ai cambiamenti climatici in Italia"; "Analisi della normativa comunitaria e nazionale rilevante per gli impatti, la vulnerabilità e l' adattamento ai cambiamenti climatici"; "Elementi per una Strategia Nazionale di Adattamento ai Cambiamenti Climatici".

Alla SNAC sono inoltre allegati: un capitolo di approfondimento della Strategia Europea di adattamento ai cambiamenti climatici e di alcune strategie e piani adottati in altri Paesi europei; un insieme di proposte di azione che si distinguono in azioni di tipo non strutturale, in azioni basate su un

[1] Organo di Governo preposto all'attuazione della politica ambientale. Istituito nel 1986, svolge funzioni in materia di: tutela della biodiversità, degli ecosistemi e del patrimonio marino-costiero, salvaguardia del territorio e delle acque, politiche di contrasto al cambiamento climatico e al surriscaldamento globale, sviluppo sostenibile, efficienza energetica ed economia circolare, gestione integrata del ciclo dei rifiuti, bonifica dei Siti d'interesse nazionale (SIN), valutazione ambientale delle opere strategiche, contrasto all'inquinamento atmosferico-acustico-elettromagnetico e dei rischi che derivano da prodotti chimici e organismi geneticamente modificati. Svolge un ruolo di indirizzo e vigilanza sulle attività dell'Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) e dei parchi nazionali e delle aree marine protette. Promuove le buone pratiche ambientali, la mobilità sostenibile e la rigenerazione urbana secondo criteri di sostenibilità. Si occupa della promozione dell'educazione ambientale nelle scuole. Si avvale della collaborazione delle Capitanerie di Porto-Guardia Costiera e del Comando unità per la tutela forestale, ambientale e agroalimentare dei Carabinieri (CUTFAA).

[2] La fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC) è una struttura di ricerca scientifica che opera nel campo della scienza del clima e si prefigge di approfondire le conoscenze sulla variabilità climatica, le sue cause e le sue conseguenze, attraverso lo sviluppo di simulazioni ad alta risoluzione con modelli globali del sistema Terra e con modelli regionali, con particolare attenzione all'area del Mediterraneo. Obiettivo specifico di queste ricerche sta nel fornire risultati scientificamente affidabili, rigorosi e aggiornati che contribuiscano a indagare, conoscere e rappresentare le interazioni tra il sistema climatico e la società, favorendo uno sviluppo sostenibile e offrendo solide conoscenze scientifiche per la realizzazione di politiche di contrasto o adattamento agli impatti dei cambiamenti climatici.

Fig. I.6.5.1 | Strategia Nazionale di Adattamento ai Cambiamenti Climatici ©MASE, 2014.

approccio eco-sistemico, in azioni di tipo infrastrutturale e tecnico, e in azioni di tipo trasversale tra settori, a breve e a lungo termine.

La SNAC rappresenta una risposta chiave dell'Italia alle sfide globali poste dai cambiamenti climatici. Questa strategia mira a proteggere le comunità, le risorse naturali e l'economia del Paese attraverso azioni di adattamento al cambiamento climatico; un tassello fondamentale soprattutto per le piccole aree rurali interne italiane che sono scrigni del nostro passato.

Come si evince nella Figura 2 è necessario sottolineare la necessità di un'azione mirata soprattutto nel Sud Italia dove l'aumento della temperatura ha avuto un impatto non indifferente sulla performance economica.

Fig. I.6.5.2 | Strategia di adattamento ai cambiamenti climatici ©Gruppo Iren, 2024.

I.6.6 PAC 2023-2027 - Piano di Azione e Coesione

In Europa, uno dei principali temi su cui si sta concentrando il dibattito inerente alla nuova Programmazione della PAC 2023-2027, sin dalle considerazioni iniziali del Reg. (UE) 2021/2115 , è quello relativo allo sviluppo dei cosiddetti "Piccoli comuni intelligenti" o *Smart Village*, visti come strumento strategico per rafforzare il tessuto socioeconomico delle aree rurali. Il tema degli *Smart Village*, o villaggi intelligenti, non è una novità assoluta introdotta dall'imminente quinquennio di programmazione comunitaria. Già nel 2017 l'Unione Europea aveva elaborato il documento strategico *EU Action for Smart Villages*, nell'ambito del quale i villaggi, o più comunemente borghi, sono definiti come "*comunità site in aree rurali che utilizzano soluzioni innovative per migliorare la propria sostenibilità e resilienza, sulla base dei punti di forza e delle opportunità locali*" . Non si tratta, dunque, di un modello universale da applicare ovunque indistintamente bensì di un approccio che deve essere di volta in volta contestualizzato al territorio e dovrebbe essere integrato in più ampie strategie di sviluppo regionale e/o territoriale (come, ad esempio, le Strategie di Sviluppo Locale LEADER).

La Commissione Europea ha attribuito alla PAC 2023-2027 un ruolo strategico per la promozione degli *Smart Villages*, prevedendo il sostegno alle strategie "Piccoli comuni intelligenti" fra gli interventi di cooperazione di cui all'art. 77 del Reg. (UE) 2021/2115. A sottolineare ulteriormente l'importanza di questo tipo di approccio programmatorio, la Commissione ha istituito uno specifico indicatore di risultato dei Piani Strategici della PAC: si tratta dell'indicatore R.40 Transizione intelligente dell'economia rurale, con cui si intende valutare il numero di strategie «Piccoli comuni intelligenti» sovvenzionate tramite i PSP. Tale tipo di intervento contribuisce prioritariamente all'obiettivo specifico 8 *"Promuovere l'occupazione, la crescita, la parità di genere, compresa la partecipazione delle donne all'agricoltura, l'inclusione sociale e lo sviluppo locale nelle zone rurali, comprese la bioeconomia circolare e la silvicoltura sostenibile"* e rappresenta un ulteriore strumento finalizzato a favorire approcci territoriali e locali aggregati.

In altri Stati Membri sono state intraprese strade diverse che vedono gli *Smart Village* prerogativa esclusiva di LEADER oppure come una delle forme di investimento previste dagli art. 73 e 74 del Regolamento UE 2021/1060. Tuttavia, non tutti gli Stati Membri hanno esplicitamente fatto riferimento alle strategie *Smart Village* nei propri PSP e ancora meno sono quelli che hanno già provato a dare un'indicazione circa i target da raggiungere in merito alla loro attuazione; tra questi vi sono Spagna, Germania, Austria, Finneria e Italia.

La **Spagna** è tra i Paesi che ha scelto di annoverare le strategie *Smart Village* tra i possibili progetti finanziabili con l'intervento Investimenti non produttivi in servizi di base nelle aree rurali. Essendo, come l'Italia, uno Stato Membro la cui attuazione della PAC è regionalizzata, tale intervento verrà attuato da 11 delle 17 comunità autonome in cui è suddiviso il Paese. La Galizia, ad esempio, intende finanziare investimenti per l'erogazione di servizi legati alle telecomunicazioni, dall'acquisto delle apparecchiature allo sviluppo di software necessari alla corretta fornitura dei servizi stessi, fino alle attività di pianificazione, gestione o qualsiasi altra attività che concorra al raggiungimento degli obiettivi fissati nei piani di digitalizzazione elaborati. La Comunità Valenciana, invece, ha scelto di orientare il proprio concetto di *Smart Village* verso progetti finalizzati all'indipendenza energetica con energie rinnovabili in comuni con meno di 5.000 abitanti.

Anche la **Germania** ha scelto di indirizzare il proprio supporto alla transizione intelligente dell'economia rurale verso l'ambito della digitalizzazione, allo scopo di fornire alle imprese e alla popolazione delle zone rurali un accesso adeguato alle moderne tecnologie dell'informazione e della comunicazione: l'Autorità di Gestione tedesca ha pianificato la realizzazione di undici operazioni per l'espansione della banda larga.

Diverso è invece l'approccio al tema dei Piccoli comuni intelligenti adottato dall'**Austria** che ha preferito individuare più interventi in grado

di contribuire all'implementazione delle strategie *Smart Village* attraverso l'approccio *bottom-up* e la pianificazione di strategie integrate grazie alla cooperazione tra soggetti concentrati a livello più locale e non esteso ai GAL. Con gli interventi 73-10 – che prevedono la Promozione dei centri urbani e 77-4 per la Riattivazione posti vacanti l'Austria intende finanziare da un lato investimenti volti alla riqualificazione e ristrutturazione di aree e/o edifici pubblici abbandonati, sottoutilizzati o utilizzati in modo improprio; dall'altro, sensibilizzare cittadini, rappresentanti delle comunità e operatori economici sul tema del rafforzamento dei centri abitati, finanziando la predisposizione e l'aggiornamento di piani di sviluppo urbano integrato propedeutici al riutilizzo degli spazi riqualificati. Un ulteriore intervento di cooperazione denominato Sistemi di innovazione rurale intende finanziare strategie di cooperazione per l'innovazione in ambito non agricolo e una rete dell'innovazione che metta in relazione sinergica i partenariati ed i rispettivi progetti.

Infine, la **Finneria** ha stabilito di istituire un intervento denominato Progetti di cooperazione *Smart Village* che individua tre macro-temi nell'ambito dei quali i beneficiari possono sviluppare le proprie strategie: innovazione economica, sfera sociale e tutela dell'ambiente. Per ciascuno dei tre ambiti d'azione è individuata poi un'ampia e non esaustiva gamma di settori verso i quali ogni strategia può focalizzarsi: trasporti, *Smart* farming, formazione, distretti del cibo, ecc. Gli altri Stati Membri come la Polonia, la Slovenia e l'Estonia prevedono di sostenere a vario titolo strategie Piccoli comuni intelligenti, puntando particolarmente sui concetti di innovazione e digitalizzazione e, soprattutto, sulle affinità con l'approccio Leader.

L'**Italia** ha scelto di costruire l'intervento interpretandolo, come suggerito dai Tool CE, come un approccio metodologico per sostenere l'attuazione di "strategie" intese come progetti integrati, condivisi da gruppi di beneficiari pubblici e/o privati locali, relativi a specifici settori/ambiti di cooperazione, allo scopo di favorire nelle comunità delle aree rurali l'uso di soluzioni innovative per migliorare la loro resilienza, le condizioni economiche, sociali e/o ambientali, la *governance* locale, le relazioni e scambi con le zone urbane, sfruttando anche le tecnologie digitali e la multifunzionalità agricola e forestale. Inoltre, nel nostro Pase gli *Smart Village* possono essere incentivati sia nell'ambito delle Strategie di Sviluppo Locale LEADER sia attraverso bandi regionali.

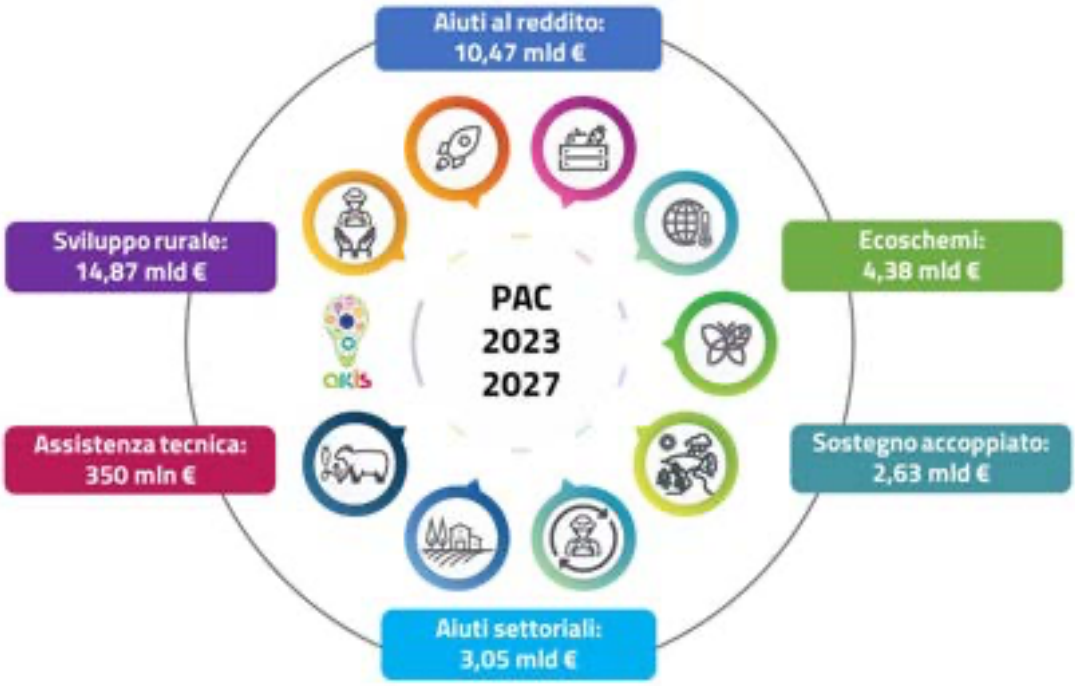


Fig. I.6.6.1 | Pac, l'Italia presenta il suo Piano Strategico 2023-2027 ©Pianeta PSR, 2024.

I.6.7 La Normativa di riferimento in Sicilia

La Sicilia, ricca di storia, cultura e tradizione, vanta numerosi centri minori caratterizzati da un patrimonio storico, architettonico e culturale di inestimabile valore. Tuttavia, il degrado urbano, lo spopolamento e la trasformazione dei contesti rurali stanno mettendo a rischio l'integrità di questi luoghi. In risposta a questa sfida, la Regione Siciliana ha adottato una serie di leggi e normative volte a promuovere la tutela e la valorizzazione dei centri minori, con l'obiettivo di preservarne l'identità e favorirne lo sviluppo sostenibile. Questo paragrafo si propone di analizzare in modo approfondito la normativa siciliana in materia, focalizzandosi sulla Legge Regionale 10 luglio 2015, n. 13 e sulla Legge Regionale 22 dicembre 2016, n. 24, e di esaminare le principali iniziative promosse dalla Regione per contrastare lo spopolamento e promuovere la rinascita dei centri minori.

La Legge Regionale 10 luglio 2015, n. 13[1] rappresenta uno strumento normativo per la tutela e la valorizzazione dei centri storici siciliani. Il suo obiettivo è quello di promuovere la conservazione del patrimonio edilizio e dei caratteri architettonici dei centri storici, nonché di favorire la revitalizzazione economica e sociale di queste aree. Tra i principali punti della legge, vi è la semplificazione delle procedure autorizzative per gli interventi di recupero e restauro degli edifici, attraverso l'istituzione di uno sportello unico per le attività di edilizia libera e la riduzione dei termini per il rilascio dei permessi. Inoltre, la legge prevede la possibilità di cambiare la destinazione d'uso degli immobili, al fine di promuovere la diversificazione delle attività economiche nei centri storici e contrastare il fenomeno dello spopolamento.

La Legge Regionale 22 dicembre 2016, n. 24 si concentra, invece, sulla rigenerazione urbana e territoriale dei borghi storici siciliani. Essa individua gli obiettivi di recupero e valorizzazione del patrimonio edilizio e culturale dei borghi, con particolare attenzione al contrasto allo spopolamento e alla promozione del ripopolamento. La legge prevede la redazione di piani specifici per ciascun borgo, attraverso i quali vengono identificati gli interventi prioritari e le risorse finanziarie necessarie per attuare tali interventi. Inoltre, vengono introdotti incentivi fiscali e finanziamenti per sostenere le attività economiche nei borghi, al fine di favorire lo sviluppo di un'economia locale sostenibile.

Entrambe le leggi offrono incentivi fiscali e finanziamenti per sostenere gli interventi di recupero e valorizzazione dei centri minori, promuovendo così la conservazione del patrimonio culturale e la crescita economica delle aree interessate.

La normativa siciliana in materia di tutela e valorizzazione dei centri minori si basa su una serie di principi fondamentali, tra cui il riconoscimento del valore storico, architettonico, archeologico e ambientale di questi luoghi, nonché l'importanza di promuovere interventi mirati per la loro conservazione e riqualificazione. Entrambe le leggi regionali analizzate presentano una serie di punti chiave, tra cui la definizione degli obiettivi di tutela e valorizzazione, la previsione di interventi ammissibili e l'introduzione di incentivi fiscali e finanziamenti per sostenere tali interventi. Inoltre, entrambe prevedono la redazione di piani specifici per ciascun centro o borgo, al fine di individuare gli interventi prioritari e garantire una gestione efficace delle risorse disponibili.

Oltre alle leggi regionali, ciascun comune adotta un Piano Regolatore Generale (PRG) e un Regolamento Edilizio per la cura, tutela e valorizzazione del patrimonio dei centri storici, affrontando diverse tematiche. Tuttavia, alcuni centri ancora si avvalgono di vecchi PRG, ma con l'entrata in vigore della nuova normativa, tutti i comuni saranno presto tenuti ad aggiornare i loro PRG a quello stabilito dalla Sicilia o dalla provincia di competenza. Ciò è reso possibile anche grazie all'operato del Centro Regionale Studi Urbanistici di Sicilia (CeRSU[2]).

Con il Decreto del Presidente della Regione Siciliana n. 531 del 20.05.2022, è stato approvato il Regolamento Tipo Edilizio Unico della Regione Siciliana, in conformità all'art. 2 della legge regionale 10.08.2016, n. 16

[1] La Legge Regionale 10 luglio 2015, n. 13 delinea disposizioni cruciali per la tutela e la valorizzazione dei centri storici in Sicilia. Di seguito sono riportati i principali punti emersi da questa legge:
["*Art. 1*: Il concetto di centri storici è definito come "agglomerati urbani consolidati di rilevante interesse storico, architettonico, archeologico e ambientale".
Art. 2: Gli obiettivi principali della legge includono: Conservazione del patrimonio edilizio e dei caratteri architettonici e tipologici.
Miglioramento della qualità urbana e delle condizioni abitative.
Promozione di attività economiche e sociali compatibili con il contesto storico.
Art. 3: Si prevede la redazione di un Piano di Recupero per ciascun centro storico, che deve contenere: Delimitazione dell'area del centro storico. Analisi del patrimonio edilizio.
Individuazione degli interventi di recupero e valorizzazione.
Art. 4: Si disciplinano gli interventi ammissibili nei centri storici, tra cui: Recupero, restauro e risanamento conservativo degli edifici.
Manutenzione straordinaria, ristrutturazione edilizia e adeguamento antisismico.
Cambio di destinazione d'uso.
Art. 5: Introduce sgravi fiscali e contributi per gli interventi di recupero e valorizzazione dei centri storici."]

[2] Legge Regionale 22 dicembre 2016, n. 24:
["*Art. 1*: Definisce i borghi storici come "insiemi urbani di rilevante valore storico, architettonico, archeologico, paesaggistico e ambientale, situati in aree interne o a rischio spopolamento".
Art. 2: Individua gli obiettivi di rigenerazione urbana e territoriale dei borghi storici, tra cui: Recupero e valorizzazione del patrimonio edilizio e dei beni culturali. Contrasto allo spopolamento e promozione del ripopolamento. Sviluppo di attività economiche e sociali sostenibili.
Art. 3: Prevede la redazione di un Piano di Rigenerazione Urbana e Territoriale per ciascun borgo storico, che deve contenere: Analisi del contesto socio-economico e ambientale del borgo. Individuazione degli interventi di recupero e valorizzazione. Stima dei costi e delle risorse finanziarie necessarie.
Art. 4: Disciplina gli interventi ammissibili nei borghi storici, tra cui: Recupero, restauro e risanamento conservativo degli edifici. Manutenzione straordinaria, ristrutturazione edilizia e adeguamento antisismico. Cambio di destinazione d'uso. Interventi di riqualificazione urbana e paesaggistica.
Art. 5: Introduce sgravi fiscali, contributi e altre forme di sostegno per gli interventi di rigenerazione urbana e territoriale dei borghi storici."]

[3] Il Centro Regionale di Studi Urbanistici, costituito nel 2021 per iniziativa della Consulta degli Ordini degli Ingegneri della Sicilia, ha l'obiettivo di incrementare l'interesse per l'urbanistica, per la pianificazione territoriale, ambientale, paesaggistica e per il relativo impianto normativo, per i problemi dell'assetto del territorio e per la tutela dell'ambiente, con

riferimento alle ricadute sull'edilizia e sul riuso edilizio, promuovendo iniziative culturali, di informazione e di aggiornamento nel territorio siciliano.
Possono essere membri effettivi del Centro Regionale di Studi Urbanistici tutti gli Ingegneri della Sicilia che condividono le finalità e gli scopi del Centro. Può altresì essere iscritto al Centro Regionale di Studi Urbanistici della Sicilia, in qualità di membro aderente, chiunque condivida le finalità e gli scopi del Centro.

e successive modifiche, nonché all'art. 29 della legge regionale 13.08.2020, n. 19 e relative integrazioni.

Entro 120 giorni dalla pubblicazione del Regolamento Tipo Edilizio Unico sulla Gazzetta Ufficiale della Regione Siciliana (Supplemento ordinario n. 1 alla GURS n. 26 del 03.06.2022), i Comuni sono tenuti ad adottare un nuovo Regolamento Edilizio, basato sul suddetto Regolamento Tipo Edilizio Unico della Regione Siciliana, apportando eventuali integrazioni necessarie per adattarne il contenuto alle specifiche caratteristiche locali, come previsto dall'art. 2 comma 2 della LR 16/2016 e successive modifiche.

Il CeRSU[3] ha elaborato le Linee Guida al fine di fornire un primo contributo metodologico per affrontare le molteplici problematiche legate alla definizione del Regolamento Edilizio comunale.

Si sottolinea che in assenza di provvedimenti espliciti da parte dei Comuni entro il suddetto termine di 120 giorni, *"le disposizioni del Regolamento Edilizio tipo regionale prevalgono comunque sulle norme dei Regolamenti edilizi comunali vigenti, sostituendoli di fatto"*.

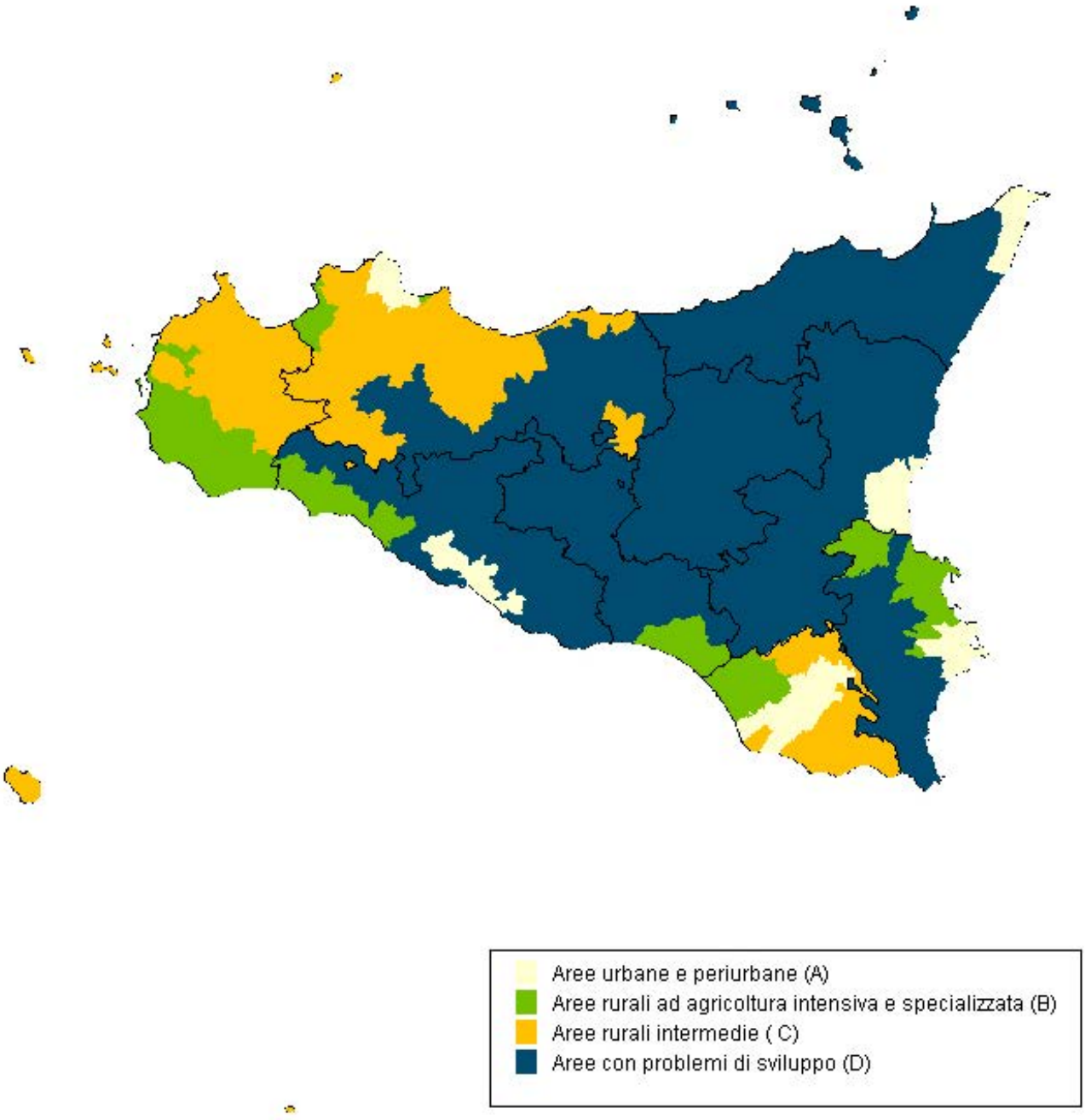


Fig. I.6.7.1 | La Sicilia e le sue aree ©Rete Rurale Nazionale, 2021.

I.7 Codici e Direttive per la tutela e la valorizzazione dei centri storici

Art. 9 – CARTA COSTITUZIONALE
La Repubblica promuove lo sviluppo della cultura e la ricerca scientifica e tecnica.
Tutela il paesaggio e il patrimonio storico e artistico della Nazione
/.../ Per di più l'obbligo costituzionale di promozione della cultura e della ricerca, che grava su tutte le articolazioni della Repubblica (e quindi tanto sullo Stato, quanto su regioni ed enti locali), impone di accogliere e favorire anche quella direttrice primaria della cultura contemporanea che si esprime,
in così larga misura nell'attività di progettazione architettonica. Attività che, quindi, rientra a pieno titolo nell'area di protezione del primo e del secondo comma dell'art. 9 della Costituzione. Ancor più nettamente, il preciso dover di tutela del paesaggio e del patrimonio storico e artistico della Nazione
posto dall'articolo 9 impone, nel concreto, di promuovere criteri di trasformazione del territorio che non rispondano soltanto ad esigenze di funzionamento e redditività. Ciò che distingue, infatti, un Paese che vuole definirsi civile, avanzato e di grandi tradizioni culturali dovrebbe essere anche la
capacità di inserire le opere di trasformazione del territorio, pubbliche e private, in un quadro organico di progresso non solo meramente economico, ma anche culturale e civile della società /.../
da Disegno di Legge in discussione presso le Commissioni Parlamentari.

La tutela e valorizzazione dei centri storici, in particolare nei pittoreschi centri minori italiani, rappresenta una sfida cruciale nel contesto della conservazione del patrimonio culturale. A fianco delle innumerevoli iniziative e normative emanate a livello italiano ed europeo, enunciate nei paragrafi precedenti, fanno parte di questo grande quadro di promozione del patrimonio locale anche le carte del restauro, le normative italiane, linee guida di tutela e valorizzazione dei centri abitati e alcune direttive e convenzioni europee.

Le Carte del restauro, in particolare, sono documenti fondamentali che delineano principi e direttive per gli interventi e giocano un ruolo essenziale in questo processo, sottolineando l'importanza di preservare l'autenticità e la specificità di questi luoghi, come i piccoli centri dell'entroterra, al più formati da un denso centro storico, intrisi di storia, architettura di pregio, cultura e tradizione. Le Carte del restauro, come la prima, e più celebre, Carta di Atene del 1931 e l'ultima in ordine di stesura, Carta di Cracovia del 2000 (*Fig. 1*), forniscono un quadro normativo e etico per il restauro dei centri storici. Questi documenti sottolineano l'importanza di un approccio oculato, rispettoso delle caratteristiche originali, delle peculiarità architettoniche e delle stratificazioni storiche presenti nei borghi, evitando interventi che possano comprometterne l'integrità storica e architettonica. Nei centri minori italiani più autentici, l'applicazione delle Carte del restauro si traduce in un'attenta analisi delle caratteristiche architettoniche e culturali locali prima di intraprendere qualsiasi intervento. Si cerca, infatti, di preservare la tessitura urbana tradizionale, le piazze, le strade lastricate e gli edifici storici, mantenendo l'aspetto originale e il contesto ambientale, tout court promuovere l'identità locale. L'obiettivo è conciliare la conservazione con le esigenze contemporanee, permettendo ai centri storici di continuare a vivere e adattarsi e approcciarsi all'innovazione senza perdere la loro autenticità.

In molti comuni italiani, l'implicazione attiva degli abitanti nella gestione e conservazione del centro storico è un elemento chiave per garantire il successo delle iniziative di recupero, basandoci sulla consapevolezza dell'unicità di ciascun luogo e sulla volontà di preservare la memoria collettiva. Attraverso un approccio attento e rispettoso, questi luoghi diventano non solo testimonianze del passato, ma anche per il futuro.
La legislazione italiana per la conservazione dei beni culturali ha una lunga storia, che affonda le sue radici nel XIX secolo. Nel 1882, con la legge n. 364, fu istituita la Soprintendenza ai monumenti e alle belle arti, che aveva il compito di tutelare e valorizzare i beni culturali italiani.

Nel 1939, con la legge n. 1089, fu introdotta la nozione di "bene culturale", che comprendeva i beni immobili e mobili di interesse storico, artistico, archeologico, etnografico, archivistico e bibliografico. La legge stabiliva inoltre che i beni culturali erano sottoposti a tutela da parte dello Stato, che aveva il diritto di intervenire in caso di necessità.

Nel 1974, con la legge n. 1089, è stata istituita la Soprintendenza per i beni ambientali e architettonici, che ha assunto il compito di tutelare, vigilare e valorizzare i beni ambientali, ovvero i beni immobili di interesse paesaggistico, storico, artistico, architettonico, archeologico, etnografico e scientifico. Nel 1999, con la legge n. 368, è stato introdotto il concetto di

Fig. I.7.1 | Quadro sinottico riepilogativo delle Carta di Restauro italiane. ©Luisa Lombardo, 2024.

"valorizzazione dei beni culturali", che comprendeva non solo la tutela, ma anche la promozione e la fruizione dei beni culturali. La legge ha, inoltre, previsto la creazione di un fondo per la valorizzazione dei beni culturali. Nel 2004, con la legge n. 42, è stato approvato il Codice dei beni culturali e del paesaggio, che ha semplificato e razionalizzato la normativa in materia di tutela e valorizzazione dei beni culturali. Il Codice ha inoltre introdotto nuove disposizioni, come la possibilità di affidare i lavori di restauro a soggetti privati in forma di concessione o di appalto.

La legislazione italiana in materia di conservazione e restauro si è evoluta nel tempo, recependo le nuove esigenze di tutela e valorizzazione dei beni culturali. In particolare, negli ultimi anni, si è assistito a un crescente interesse per la valorizzazione dei beni culturali, che viene sempre più considerata un elemento essenziale per la loro tutela.

I centri storici rappresentano un patrimonio culturale di inestimabile valore, che testimonia la storia e la cultura del nostro Paese. Questi sono spesso caratterizzati da un'architettura di grande pregio, autentica e che rende questi luoghi unici al mondo. Tuttavia, i centri storici dei piccoli borghi sono anche soggetti a numerosi rischi, tra cui il degrado, l'abbandono e il turismo di massa. Per salvaguardare questi centri è necessario un intervento coordinato da parte delle istituzioni, che deve essere basato su una solida base normativa e una perfetta sinergia tra le materie di recupero e restauro.

Le carte del restauro e le leggi italiane svolgono un ruolo fondamentale nella salvaguardia e forniscono un quadro di riferimento per garantire che questi interventi siano eseguiti nel rispetto dei principi scientifici e della tutela del patrimonio culturale. Queste norme, infatti, consentono di coniugare la tutela del patrimonio culturale con la valorizzazione di questi luoghi, che rappresentano un'importante risorsa per il nostro Paese.
Lo studio e l'analisi del quadro normativo fornisce il ventaglio degli interventi nonché delle azioni possibili in contesti ben conservati e tutelati come nella maggior parte dei centri minori. Pur dovendo dare un taglio asclusivo al recupero, tali studi sono propedeutici per una comprensione delle dinamiche territoriali nonché delle azioni possibili. Spesso, infatti, i piccoli centri sono all'interno di beni naturalistici riconosciuti a livello mondiale e presentano, oltre al tessuto edilizio di base, anche un patrimonio monumentale che li rende unici e importanti per la storia italiana.

Fig. I.7.2 | Centri storici italiani ©Italia Nostra, 2021.

I.7.1 Dichiarazione di Davos 2018 - Una cultura della costruzione di qualità per l'Europa

Nel gennaio 2018, i ministri della cultura europei hanno adottato la Dichiarazione di Davos intitolata "Verso una cultura della costruzione di qualità per l'Europa". Questa dichiarazione ha delineato una via strategica e politica per diffondere e consolidare una cultura della costruzione di elevata qualità. Sottolinea il concetto che costruire è un atto culturale che crea spazio per la cultura stessa. La Dichiarazione di Davos è stata citata e ampiamente discussa a livello mondiale, diventando un punto di riferimento per Stati, organizzazioni, istituzioni e imprese (Jokilehto J., 2017).

Il movimento per la cultura della costruzione, seguendo l'impegno sancito dalla Dichiarazione di Davos, continua su un piano strategico, politico e scientifico. Si propone di approfondire la riflessione scientifica sui concetti fondamentali e di precisare i termini chiave della dichiarazione. Parallelamente, promuove strategie politiche che riconoscano il valore culturale della conservazione, della pianificazione territoriale e della costruzione, ponendo come obiettivo primario la realizzazione di una cultura della costruzione di qualità (Cleere H. & ICOMOS, 2002). Le varie iniziative internazionali associate a questo processo sono consolidate sotto il nome di "Processo di Davos". Proprio nei piccoli centri he conservano un patrimonio e delle tradizioni costruttive uniche p un imperativo parlare di qualità.

La cultura della costruzione è definita come un approccio che considera l'ambiente antropico nel suo complesso, abbracciando aspetti che vanno dalla sostanza edilizia alla produzione contemporanea, dai dettagli artigianali agli edifici e agli spazi liberi, fino alle grandi infrastrutture. La definizione di "cultura della costruzione di qualità" rimane oggetto di dibattito, ma numerose iniziative sono state promosse per migliorare la qualità dell'ambiente antropico.

Il Sistema Davos per la qualità nella cultura della costruzione è stato sviluppato per valutare le qualità dei luoghi attraverso otto criteri fondamentali: *governance, funzionalità, ambiente, economia, diversità, contesto, genius loci e bellezza* (*Fig. 1*). Questo strumento si rivela utile nella pianificazione, nei progetti, nelle valutazioni di concorsi o nei processi partecipativi. È progettato per considerare e ponderare i valori sociali, emotivi e culturali insieme agli aspetti tecnici e funzionali.

Il modulo di valutazione del Sistema Davos comprende una serie di domande per ciascuno degli otto criteri, adattabili alle peculiarità di luoghi o progetti specifici. Le risposte consentono di determinare il livello effettivo di qualità di un luogo, evidenziando punti di forza e punti deboli.

La Fondazione Cultura della costruzione Svizzera ha reagito con cautela alla prima versione del Sistema Davos, tacciandolo di "approccio tecnocratico" che potrebbe "corrompere l'essenza della *Baukultur*". Tuttavia, il Sistema Davos mira a superare le divisioni tra discipline e a coinvolgere i cittadini nel dialogo sulla qualità nella costruzione. Inoltre, cerca di bilanciare l'autorità dei professionisti nei giudizi attraverso l'utilizzo nei concorsi e nelle gare d'appalto.

La sfida consiste nel permettere la nascita di un "discorso sulla qualità" che coinvolga non solo una giuria prestabilita ma anche cittadini e professionisti al di fuori delle cerchie ristrette. L'obiettivo è stimolare una riflessione sulla qualità dell'ambiente costruito, cercando di coinvolgere progettisti, cittadini e professionisti nel dialogo.

La valutazione complessiva del Sistema Davos potrebbe produrre risultati eterogenei, influenzati dalla prospettiva del valutatore, che potrebbe essere il sindaco di un piccolo comune, come per il caso dei borghi o paesi italiani, o un architetto. L'obiettivo è avviare un'autonoma riflessione, permettendo a ciascuno di porsi domande sulla qualità, valutando il proprio contesto e la propria posizione. Il *benchmarking* e la definizione di indicatori per ciascun criterio sono previsti in una fase successiva.

I.7.1.1 Definizione di cultura di costruzione

L'ambiente antropico è parte della nostra quitidianità per cui è fondamentale promuovere una cultura della costruzione di alta qualità per il nostro benessere complessivo. La cultura della costruzione abbraccia l'ambiente antropico nella sua totalità, considerandolo come un insieme integrato: dalla sostanza edilizia alla produzione contemporanea; dai piccoli dettagli artigianali agli edifici e agli spazi aperti, estendendosi fino a includere le grandi infrastrutture; dalla fase di progettazione a quella di costruzione, dalla messa in funzione al riutilizzo, e, infine, prendendo in considerazione anche il paesaggio. In effetti, la definizione precisa di ciò che rientra o meno nella categoria di "cultura della costruzione di qualità" rimane ancora oggetto di dibattito (Forster K., 2018).

Numerose iniziative sono state intraprese con l'obiettivo di migliorare la qualità complessiva dell'ambiente antropico. Queste iniziative spaziano dalle attività artigianali di dettaglio alla realizzazione di edifici, alla creazione di spazi liberi e all'implementazione di grandi infrastrutture. In tal modo, la promozione di una cultura della costruzione di qualità mira a ottimizzare ogni fase del processo, dall'ideazione alla riutilizzazione, contribuendo così a creare un ambiente antropico più sostenibile e gratificante.

Una cultura della costruzione di elevata qualità si riflette in città, villaggi ed edifici concepiti e realizzati secondo criteri di eccellenza. Questi luoghi di qualità contribuiscono a creare un ambiente di vita piacevole, promuovendo il benessere e la salute delle persone. Il Sistema Davos per la qualità nella cultura della costruzione è stato sviluppato per offrire la possibilità di valutare le qualità dei luoghi attraverso gli otto criteri fondamentali. La sua utilità si estende anche alla fase di pianificazione e progettazione, alla valutazione di concorsi o nei processi partecipativi. Ciò che rende questo sistema unico è la sua capacità di integrare valori sociali, emotivi e culturali con gli aspetti tecnici e funzionali, proprio come dovrebbe essere per lo sviluppo di territori.

Elaborato in collaborazione con partner internazionali dall'Ufficio federale della cultura svizzero, il Sistema Davos per la qualità nella cultura della costruzione contribuisce attivamente al Processo di Davos, avviato nel 2018 con l'adozione della Dichiarazione di Davos integrando gli strumenti esistenti e impegnandosi a preservare e sviluppare luoghi diversificati, distinti da una cultura della costruzione di alta qualità considerando anche tre criteri fondamentali quali *Firmitas, Utilitas, Venustas*[1]. Tuttavia, l'approccio moderno stimola la riflessione su progetti vari, moltiplicando le prospettive e incentivando una visione più ampia.

Inoltre, il Sistema Davos propone di misurare i progetti assegnando un voto per ciascuna categoria, al fine di valutarli complessivamente. La valutazione finale di un progetto è determinata dalla media di tali voti. Secondo il sociologo Steffen Mau[2], la quantificazione potrebbe portare a una semplificazione dei criteri e a una polarizzazione a favore di quelli esprimibili numericamente.

Fig. I.7.1.1 | Dichiarazione di Davos ©Widgers We Forum, 1988

[1] Sin dall'epoca di Vitruvio, per dare ad una costruzione il titolo di "architettura" erano necessari tre parametri di giudizio: la Firmitas (ovvero la solidità statica e materiale), la Venustas (cioè la bellezza estetica, data solitamente dalle proporzioni) e l'Utilitas (l'utilità funzionale). Il concetto della bellezza di un'opera è sicuramente soggettiva, soprattutto influenzata da una particolare corrente di pensiero; la staticità è essenziale, senza di essa saremmo circondati da edifici che crollano e che cessano la loro vita nell'arco di pochi anni. Ma per quanto riguarda l'utilità funzionale? Nel leggere diremmo che, al pari della firmitas, è un elemento essenziale per la fruizione di un edificio, in quanto ogni architettura è progettata in base ad una determinata funzione e senza di essa cesserebbe la necessità della costruzione. Pensando ai progetti dei grandi maestri ci si può perdere nel mare dei significati ad essi attribuiti dagli storici o dalla storia stessa, ma se ci fermiamo a riflettere possiamo notare come spesso la funzionalità o, per meglio dire, la vivibilità delle opere è messa a dura prova proprio dalla trasposizione delle idee in edifici. E' così che la perfezione data dalle linee e dalle proporzioni viene guastata da una scala troppo ripida, da infiltrazioni, da materiali poco adatti al luogo. (Valentina Guidi, 2012)

[2] Steffen Mau, https://ces.fas.harvard.edu/people/steffen-mau (ultimo accesso 22.12.2023)

Davos
"baukultur"

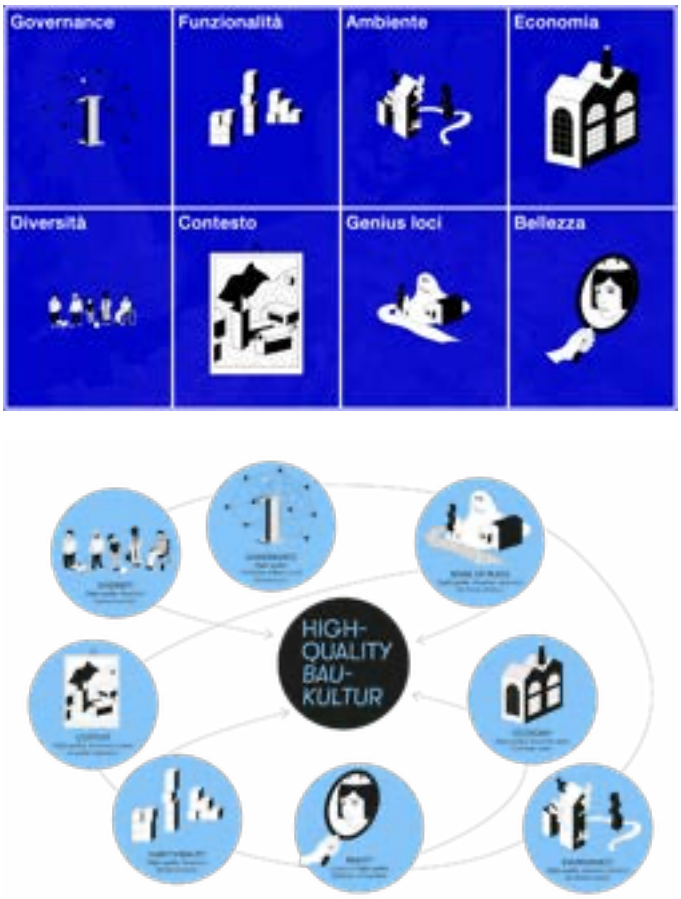


Fig. I.7.1.1.1 | Sistema di Davos per la qualità nella cultura della costruzione. Otto criteri per una cultura della costruzione di qualità. ©Davos Declaration, 2018.

I.7.2 ICOMOS - Città e Villaggi Storici

ICOMOS, il Consiglio Internazionale dei Monumenti e dei Siti, si configura come un'organizzazione non governativa e *advisory body* dell'UNESCO, con la missione precipua di promuovere la conservazione, la protezione, l'uso e la valorizzazione di monumenti, complessi costruiti e siti di rilevanza storica e culturale.

La tematica riguardante i centri minori assume un ruolo di fondamentale rilevanza nello sviluppo della società italiana, soprattutto in considerazione dell'accelerazione e del rilancio verificatisi in seguito alla pandemia, che ha indotto una tendenza all'abbandono delle grandi aree metropolitane a favore dei piccoli comuni, finalizzata a garantire una migliore qualità della vita.

L'ICOMOS CIVVIH[1], nel corso degli anni, ha attivamente contribuito alla conservazione urbana integrata delle città e dei villaggi storici a livello internazionale. Un significativo passo in questa direzione è rappresentato dalla redazione dei "Principi di Valletta per la Salvaguardia e la gestione delle città storiche e degli insiemi urbani" (Carta ICOMOS CIVVIH 2011). Negli anni 2020 e 2021, l'ICOMOS ha dedicato la propria attenzione alla valorizzazione del ricco patrimonio culturale, materiale e immateriale, dei borghi e dei piccoli comuni, sottolineando la necessità di una riqualificazione e valorizzazione di tali contesti (Smith L., 2018).

In questo contesto, si è approfondito il tema della Legge n.158 del 2017, comunemente nota come "Legge Salva Borghi" (approfondita nel paragrafo successivo), con l'obiettivo di sollecitare una proposta migliorativa della stessa e garantirne la piena applicazione. In un momento cruciale come quello attuale, in cui è necessario sintetizzare i diversi progetti strategici avviati in passato, ICOMOS intende mettere a disposizione la propria esperienza. Ciò include l'analisi delle buone pratiche condotte a livello locale, nonché la registrazione delle problematiche riscontrate (Avrami E. & ICOMOS, 2000).

ICOMOS CIVVIH ha intenzione di avviare un Osservatorio delle più interessanti attività sviluppate dalle realtà locali, con l'obiettivo di identificare proposte concrete che possano determinare un miglioramento dell'attuale situazione. L'obiettivo finale è contribuire affinché l'Italia sfrutti in modo efficace le risorse della Next Generation EU per attuare opere di riqualificazione dei piccoli centri minori, tutelando e valorizzando il patrimonio naturale, rurale, storico-culturale e le antiche tradizioni locali[2].

Per contrastare lo spopolamento, si auspica l'adozione di nuovi strumenti operativi, quali un sistema dei servizi essenziali (istruzione, salute e trasporti) e l'innovazione tecnologica (banda larga), all'interno di uno sviluppo sostenibile. Questo richiede un indirizzamento dei fondi in una corretta linea di intervento di riqualificazione e valorizzazione in operazioni di pubblico interesse (Choay F., 2001).

Affinché ciò avvenga in maniera efficace, è imperativo definire e condividere le priorità di azione per il futuro, incoraggiando la costruzione di una nuova visione territoriale allargata.

Questo implica il coinvolgimento delle amministrazioni locali e delle autorità pubbliche, principali beneficiari, nella definizione di idee comuni per orientare la spesa secondo linee guida concordate. Inoltre, è cruciale evitare che i fondi siano indirizzati in operazioni privatistiche di interesse personale, promuovendo invece interventi che contribuiscano al bene comune e al rafforzamento delle capacità e competenze del personale e delle organizzazioni coinvolte. L'idea di *Smart Villages* è, dunque, alla base dell'ICOMOS.

[1]ICOMOS CIVVIH, acronimo di International Committee on Historic Towns and Villages (Comitato Internazionale delle Città e dei Villaggi Storici), è un'organizzazione non governativa affiliata all'ICOMOS (International Council on Monuments and Sites). La sua missione principale è dedicata alla promozione della conservazione urbana integrata delle città e dei villaggi storici a livello internazionale. Alcuni aspetti chiave di ICOMOS CIVVIH includono:
- Promuovere la conservazione e la gestione sostenibile delle città e dei villaggi storic;
- Favorire lo scambio di esperienze e conoscenze tra professionisti del settore;
- Sviluppare strumenti e linee guida per la conservazione urbana;
- Sensibilizzare l'opinione pubblica sull'importanza del patrimonio storico urbano.
Organizza conferenze, workshop e seminari finalizzati alla discussione e all'approfondimento di tematiche legate alla conservazione urbana. Pubblica studi e ricerche sulla conservazione urbana per contribuire alla diffusione di conoscenze nel settore. Collabora attivamente con enti pubblici e privati per la realizzazione di progetti concreti volti alla conservazione del patrimonio storico urbano. Sviluppa standard e linee guida per la gestione dei centri storici, fornendo un quadro normativo per orientare le azioni di conservazione.
Tra i suoi documenti chiave i "Principi di Valletta per la Salvaguardia e la gestione delle città storiche e degli insiemi urbani" (Carta ICOMOS CIVVIH 2011): Questo documento rappresenta un pilastro fondamentale, definendo i principi guida per la conservazione e la gestione sostenibile delle città e dei villaggi storici. La Carta fornisce un quadro concettuale per le pratiche di conservazione e costituisce un riferimento importante per gli esperti del settore.

[2]La concezione di "conservazione integrata" ampiamente riconosciuta a livello mondiale (UNESCO, ICOMOS, ICCROM, Consiglio d'Europa, ecc.), pone in evidenzia tutti i singoli valori, uniti nella loro complessità e tutelati nella loro unità-identità in unicum che costituisce il valore urbano. Valore urbano che spesso è soggetto a "rischio". Cioè tutto ciò è quanto la città storica può perdere nel caso di una catastrofe naturale, senza escludere anche gli altri rischi ai quali gli insediamenti urbani di antica origine sono soggetti: quali quelli ambientali (inquinamento, ecc.), quelli antropici (guerre, ecc.). Tra i rischi vanno considerati oggi anche quelli della pressione turistica e l'uso distorto del patrimonio urbano con il fenomeno ben noto, posto all'attenzione da Françoise Choay, dell'attuale "industria culturale" (da Teresa Colletta, Il valore urbano, 2005).

I.7.3 Legge "Salva Borghi"

Tornando all'Italia, la Legge Salva Borghi N°158/2017 – Piccoli Comuni è stata concepita al fine di promuovere e agevolare lo sviluppo sostenibile, economico, sociale, ambientale e culturale dei piccoli comuni. Questa normativa mira a mantenere l'equilibrio demografico nel Paese, incoraggiando la residenza in tali comunità e proteggendo e valorizzando il loro patrimonio naturale, rurale, storico-culturale e architettonico (Romano F., 2022). La legge promuove specifiche misure a sostegno dei residenti nei piccoli comuni e delle attività produttive presenti, con particolare attenzione al sistema dei servizi essenziali. L'obiettivo principale è contrastare lo spopolamento di queste località e incentivare l'afflusso turistico (Dalla Zuanna G., 2022).
Tra le sue caratteristiche:

- **beneficiari:** Comuni con una popolazione fino a 5000 abitanti o comuni formati a seguito di fusione, ciascuno con una popolazione fino a 5000 abitanti;
- **tipo di agevolazione:** Contributo a fondo perduto al 100%;
- **dotazione finanziaria:** 160 milioni di euro fino al 2023;
- **apertura bando:** Si prevede l'apertura del bando entro la fine dell'anno, una volta definite le misure attuative definitive per il conferimento del contributo.

L'insediamento nei piccoli comuni è considerato una risorsa cruciale per preservare il territorio, soprattutto per le attività di contrasto al dissesto idrogeologico e per la manutenzione diffusa dei beni comuni (De Bernardi A., 2021). La legge identifica i piccoli comuni come quelli con una popolazione residente fino a 5.000 abitanti, compresi i comuni formati a seguito di fusione tra comuni con popolazione fino a 5.000 abitanti. Tra le priorità degli interventi nei piccoli comuni figurano:

- qualificazione e manutenzione del territorio, con interventi di recupero e riqualificazione di immobili esistenti e di aree dismesse, e azioni finalizzate alla riduzione del rischio idrogeologico;
- sicurezza e riqualificazione delle infrastrutture stradali e degli edifici pubblici, con attenzione particolare a quelli scolastici, per la prima infanzia e socio-assistenziali;
- miglioramento dell'efficienza energetica del patrimonio edilizio pubblico e promozione di impianti di produzione e distribuzione di energia da fonti rinnovabili;
- acquisizione e riqualificazione di terreni e edifici abbandonati per sostenere l'imprenditoria giovanile e avviare nuove attività turistiche e commerciali;
- acquisizione di case cantoniere e di terreni ferroviari dismessi, con l'obiettivo di sviluppare piste ciclabili e promuovere la valorizzazione turistica;
- riqualificazione urbana dei centri storici, con particolare attenzione agli antichi borghi e ai centri storici abbandonati o spopolati;
- recupero di beni culturali, storici, artistici e librari;
- recupero dei pascoli montani per favorire la produzione di carni e formaggi di qualità.

La legge include articoli specifici, come l'istituzione di un Fondo per lo sviluppo strutturale, economico e sociale dei piccoli comuni, finanziamenti per la tutela dell'ambiente e dei beni culturali, misure per contrastare l'abbandono di immobili, promozione di alberghi diffusi, sviluppo della rete a banda ultralarga, e promozione di prodotti locali attraverso filiere corte e a chilometro zero: uno strumento fondamentale per preservare e valorizzare il patrimonio delle comunità rurali, sostenendone la crescita e l'attrattività (Caciagli M., 2020).

Fig. I.7.3.1 | Civita Bagnoregio, la città che muore. ©GoGuides, 2020.

I.7.4 FOSMIT - Fondo per lo Sviluppo delle Montagne Italiane

Il 18 Settembre 2024 è stato annunciato un bando da 19 milioni di euro destinato ai Comuni montani e parzialmente montani della Sicilia (D.A. n.367/Serv. 6 del 18.09.2024), finanziato dal Fondo per lo sviluppo delle montagne italiane (Fosmit), con risorse assegnate dalla Presidenza del Consiglio dei ministri alla Regione Siciliana.
Tra questi, numerosi fanno parte del comprensorio delle Madonie e di altre aree interne che saranno analizzate in dettaglio nei capitoli successivi. Tra i Comuni partecipanti: Scillato, Sclafani Bagni, Valledolmo, San Mauro Castelverde, Pollina, Polizzi Generosa, Petralia Soprana, Petralia Sottana, Montemaggiore Belsito, Isnello, Gratteri, Geraci Siculo, Gangi, Collesano, Castelbuono, Caltavuturo, Caccamo, Aliminusa e Alimena.

Il bando ha l'obiettivo di sostenere interventi di valorizzazione e promozione delle aree montane, rafforzando le reti sociali locali, riducendo lo spopolamento e migliorando l'attrattività di questi territori fragili. Le aree di intervento finanziabili comprendono:

- **informatizzazione:** progetti di alfabetizzazione e inclusione digitale, volti a stimolare l'uso del web e favorire la partecipazione digitale della popolazione;
- **beni strumentali:** acquisizione di strumenti per migliorare i servizi essenziali nei Comuni;
- **valorizzazione del patrimonio:** promozione e riqualificazione del patrimonio esistente, sia materiale che immateriale, al fine di incrementare l'attrattività turistica e culturale;
- **efficientamento energetico:** interventi mirati a ridurre la dipendenza da fonti energetiche fossili nel medio e lungo termine e a migliorare l'efficienza energetica delle infrastrutture pubbliche;
- **manutenzione stradale:** interventi di manutenzione ordinaria e straordinaria delle strade comunali e intercomunali, essenziali per migliorare la mobilità interna e il collegamento tra diverse aree montane.

L'attuale assessore regionale alle Autonomie locali e alla Funzione pubblica, Andrea Messina, ha sottolineato che questo bando è il risultato di un intenso lavoro di coordinamento tra vari assessorati regionali e l'Autorità di Bacino per il recupero di fondi nazionali che sarebbero andati persi. Messina ha ribadito che i 19 milioni di euro recuperati rappresentano un impegno concreto del governo regionale per sostenere e sviluppare i Comuni montani, lasciando alle amministrazioni locali la libertà di presentare progetti in settori di rilevante importanza per la promozione dei loro territori.

L'obiettivo principale del bando è rafforzare l'attrattività di queste aree vulnerabili e ridurre il rischio di spopolamento. Ciò verrà realizzato attraverso il potenziamento delle reti sociali e la valorizzazione del patrimonio culturale, ambientale e infrastrutturale. Questo approccio è in linea con il concetto del **"Turismo delle radici"**[1], che promuove un'offerta turistica legata alla memoria dei luoghi, particolarmente incentrata sui valori locali e sulle tradizioni storiche.

I Comuni interessati devono presentare i loro progetti, con dettagli e previsioni dei costi, entro 45 giorni dalla pubblicazione dell'avviso sulla Gazzetta ufficiale della Regione Siciliana. Ogni progetto dovrà essere approvato dalla giunta locale prima della sua presentazione, pena l'esclusione dal bando. Per facilitare la partecipazione e spiegare i dettagli della misura, sono previsti due incontri operativi con i sindaci e i tecnici comunali, che si terranno nei prossimi giorni a Palermo e Catania. Questi incontri avranno lo scopo di fornire tutte le informazioni necessarie per la corretta presentazione dei progetti.
Gli obiettivi generali del bando sono:

- rafforzare le infrastrutture e i servizi essenziali delle aree montane, nonché la viabilità attraverso manutenzione ordinaria e straordinaria delle strade comunali e intercomunali.

[1] Il turismo delle radici rappresenta un fenomeno crescente che coinvolge milioni di italo-discendenti in tutto il mondo, offrendo loro l'opportunità di riscoprire le proprie origini e di riconnettersi con la terra dei loro antenati. Il 2024, proclamato Anno delle Radici Italiane dal Ministero degli Affari Esteri e della Cooperazione Internazionale, costituisce un'occasione fondamentale per valorizzare i piccoli borghi italiani, come Castelsaraceno, che si preparano ad accogliere questi "turisti di ritorno". Questi luoghi, ricchi di autenticità, offrono ai visitatori non solo la possibilità di immergersi nelle tradizioni e nella cultura locale, ma anche di ritrovare tracce della propria storia familiare.

Il concetto di turismo delle radici si ispira al processo di "rooting", simile alla capacità rigenerativa delle piante di radicarsi e prosperare nel tempo, anche in condizioni avverse. Questo tipo di turismo interessa gli italiani emigrati e i loro discendenti, che, nel periodo tra il XIX e il XX secolo, hanno lasciato l'Italia per cercare nuove opportunità altrove. Si stima che circa 80 milioni di italo-discendenti risiedano in paesi come Argentina, Australia, Brasile, Stati Uniti e Canada, molti dei quali intraprendono un viaggio per riconnettersi con i luoghi di origine.

In questo contesto, il turismo delle radici diventa anche uno strumento per la destagionalizzazione del turismo, offrendo ai borghi come Castelsaraceno un'opportunità di crescita e sviluppo sostenibile.

Il "Turismo delle Radici" è un'offerta turistica strutturata attraverso appropriate strategie di comunicazione, che coniuga alla proposta di beni e servizi del terzo settore (alloggi, eno-gastronomia, visite guidate) la conoscenza della storia familiare e della cultura d'origine degli italiani residenti all'estero e degli italo-discendenti che, vale la pena ricordarlo, sono stimati in un bacino di utenza che sfiora gli 80 milioni di persone.

Nel 1997 l'ENIT inseriva nella categoria «Turista delle Radici» 5,8 milioni di viaggiatori che visitavano il nostro paese. Nel 2018, undici anni dopo, questo numero era aumentato a 10 milioni (+72,5%).

Nel 2018 il flusso economico in entrata generato dal Turismo delle Radici è stato pari a circa 4 miliardi di euro (+7,5% rispetto all'anno precedente).
da Ministero degli Affari Esteri e della Cooperazione Internazionale. (2024). Turismo delle radici. https://www.esteri.it/it/servizi-consolari-e-visti/italiani-all-estero/turismo-delle-radici/

- promuovere la transizione digitale e l'uso delle tecnologie per l'inclusione sociale.
- valorizzare il patrimonio naturale e culturale.
- ridurre la dipendenza da fonti energetiche fossili e promuovere un uso più sostenibile delle risorse.
- contrastare lo spopolamento attraverso il miglioramento della qualità della vita nelle aree montane.

Il bando rappresenta una risposta alle sfide di spopolamento e marginalizzazione che le aree montane siciliane affrontano, offrendo un'opportunità per stimolare il loro sviluppo economico, sociale e turistico.

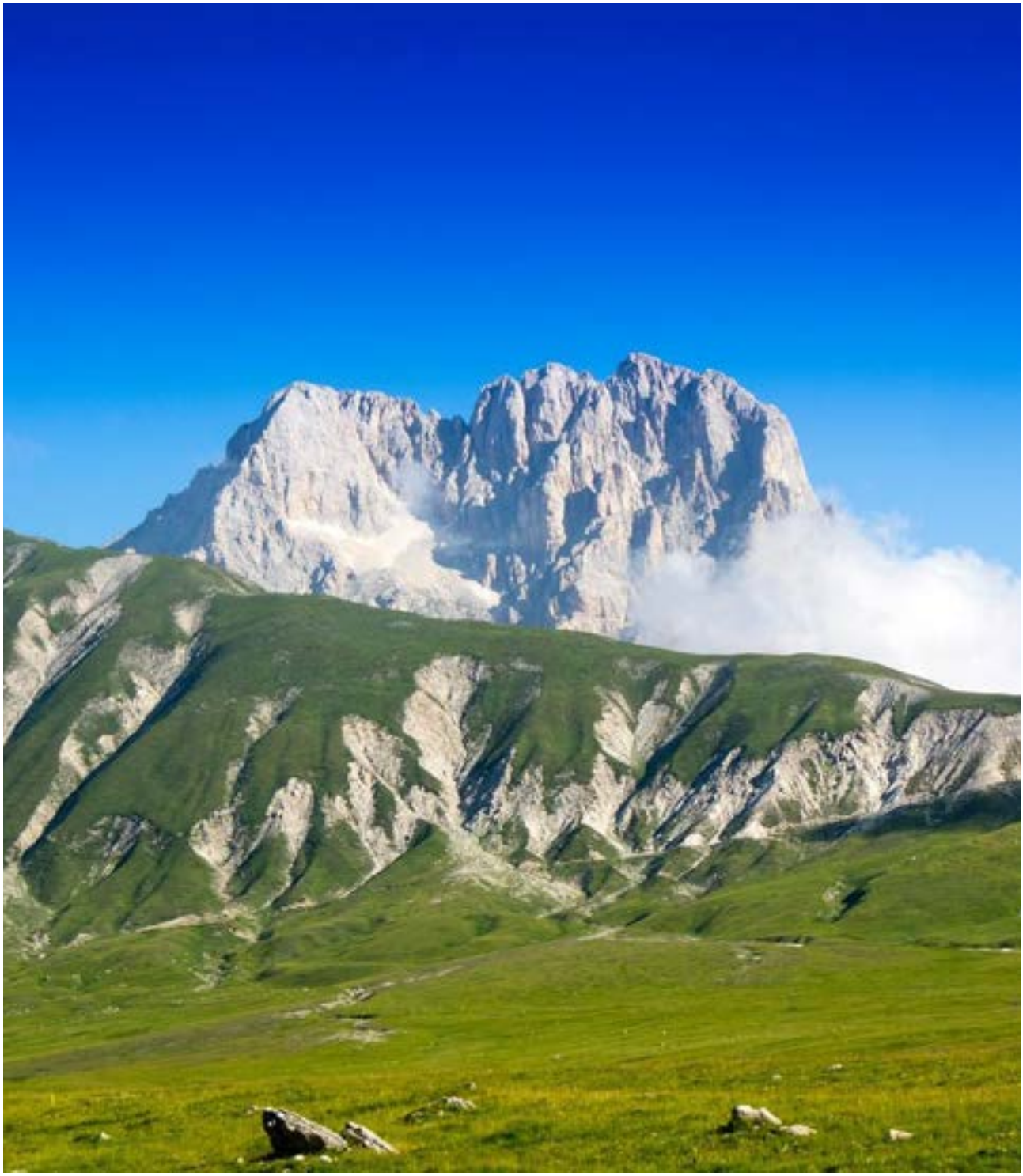


Fig. I.7.4.1 | Il Gran Sasso d'Italia, in Abruzzo, il massiccio montuoso più alto dell'Appennino. ©Meteored, 2024.

DICONO SULLE AREE INTERNE ITALIANE

“

Le aree interne sono un patrimonio inestimabile del nostro Paese, ma anche un'area fragile e spesso dimenticata. Dobbiamo lavorare per colmare il divario tra queste aree e il resto del Paese, investendo in infrastrutture, servizi e sviluppo economico.

Giuseppe Conte,
Presidente del Consiglio dei Ministri (2018-2021)

“

Le aree interne sono un'Italia nascosta, ma anche un'Italia viva. Dobbiamo valorizzare queste aree, rendendole attratte per i giovani e le imprese.

Matteo Renzi,
Presidente del Consiglio dei Ministri (2014-2016)

“

Le aree interne sono un mosaico di paesaggi, culture e tradizioni. Sono un patrimonio da tutelare e valorizzare, ma anche un'opportunità per lo sviluppo sostenibile.

Giuseppe Dematteis,
geografo italiano

“

Le aree interne sono un'Italia che non si vede, ma che è viva e pulsante. Dobbiamo investire in queste aree per farle diventare protagoniste del nostro sviluppo.

Enrico Letta,
Presidente del Consiglio dei Ministri (2013-2014)

“

Le aree interne sono un'opportunità per il nostro Paese. Sono ricche di storia, cultura e natura, ma anche di risorse umane. Dobbiamo investire in queste aree per farle diventare un motore di sviluppo economico e sociale.

Maria Elena Boschi,
Ministro per le Riforme Costituzionali e la Semplificazione (2014-2016)

“

Le aree interne sono un'Italia a parte, una Italia che non è riuscita a stare al passo con lo sviluppo del resto del Paese. Dobbiamo invertire questa tendenza, investendo in queste aree per farle diventare un'Italia più unita e più prospera.

Fabrizio Barca,
economista e politico italiano

“

Le aree interne sono un'Italia da riabitare. Dobbiamo invertire la tendenza all'abbandono di queste aree, creando opportunità di lavoro e di vita per i giovani.

Emanuele Massetti, economista italiano

“

Le aree interne sono un'Italia dimenticata, ma che ha tanto da offrire. Dobbiamo valorizzare queste aree, rendendole un'opportunità per tutti.

Pier Luigi Bersani,
Presidente del Consiglio dei Ministri (2013)

“

Le aree interne sono un'Italia ricca di storia, cultura e natura. Dobbiamo investire in queste aree per farle diventare un modello di sviluppo sostenibile.

Silvio Berlusconi,
Presidente del Consiglio dei Ministri (2001-2006 e 2008-2011)

“

Le aree interne sono un laboratorio sociale e culturale. Possono offrire un modello di sviluppo alternativo, basato sulla sostenibilità e sulla valorizzazione delle risorse locali.

Massimo Bricocoli,
sociologo italiano

“

Le aree interne sono un'opportunità per lo sviluppo economico e sociale del Paese. Dobbiamo investire in queste aree per creare opportunità di lavoro e di vita per i giovani.

Luca Salvati,
economista italiano

“

Le aree interne sono un'Italia viva e resiliente. Possono offrire un modello di sviluppo innovativo, basato sulla partecipazione e sulla cooperazione.

Annalisa Colombi,
antropologa italiana

“

Le aree interne sono un crocevia di culture e tradizioni, un patrimonio da tutelare e valorizzare.

Paolo Cognetti,
scrittore italiano

“

Le aree interne sono un'Italia che non ha paura di cambiare, che guarda al futuro con ottimismo.

Davide Cassani,
ciclista italiano

“

Le aree interne sono un'Italia che ha tanto da offrire, ma che spesso viene dimenticata. Dobbiamo impegnarci per farle conoscere e apprezzare.

Paola Severino,
giurista italiana

“

Le aree interne sono una risorsa preziosa per il nostro Paese. Dobbiamo investire in queste aree per farle diventare un motore di sviluppo sostenibile e inclusivo.

Mario Draghi,
Presidente del Consiglio dei Ministri (2021-2022)

“

Le aree interne sono un'Italia autentica, che ha tanto da offrire. Dobbiamo valorizzare queste aree, rendendole un'attrazione per i turisti e per gli investitori.

Luigi Di Maio,
Ministro degli Affari Esteri e della Cooperazione Internazionale (2018-2021)

“

Le aree interne sono un patrimonio da difendere e valorizzare. Dobbiamo impegnarci per garantire a queste aree le stesse opportunità del resto del Paese.

Giorgia Meloni,
Presidente del Consiglio dei Ministri (2014-in carica)

“

Le aree interne sono un'Italia arcaica, che conserva le sue tradizioni e la sua cultura. Dobbiamo preservare questo patrimonio, che è un'ancora di salvezza per il nostro Paese.

Giuseppe Tomasi di Lampedusa,
scrittore italiano

“

Le aree interne sono un'Italia nascosta, ma che è ricca di bellezza e di magia. Dobbiamo riscoprire queste aree, che possono offrirci nuove prospettive di vita.

Paolo Rumiz,
giornalista e scrittore italiano

“

Le aree interne sono un'Italia diversa, che può offrirci un modello di sviluppo alternativo, basato sulla sostenibilità e sulla solidarietà.

Francesco Remotti,
antropologo italiano

“

Le aree interne sono un'Italia che resiste, che non si arrende alle difficoltà.

Fabrizio De Andrè,
cantautore italiano

“

Le aree interne sono un'Italia che ha bisogno di noi, di un impegno concreto per il suo sviluppo.

Giovanni Paolo II,
Papa

“

Le aree interne sono un'Italia che ci parla, che ci racconta la sua storia e la sua cultura.

Carlo Petrini,
fondatore di Slow Food

“

Le aree interne sono un'Italia che deve essere resa più inclusiva e accessibile. Dobbiamo investire in queste aree per garantire ai bambini e ai giovani le stesse opportunità del resto del Paese.

Stefania Craxi,
Presidente della Commissione parlamentare per l'infanzia e l'adolescenza (2022-in carica)

“

Le aree interne sono un'Italia da riabitare. Dobbiamo invertire la tendenza all'abbandono di queste aree, creando opportunità di lavoro e di vita per i giovani.

Emanuele Massetti,
economista italiano

“

Le aree interne sono un'Italia viva e resiliente. Possono offrire un modello di sviluppo innovativo, basato sulla partecipazione e sulla cooperazione.

Annalisa Colombi,
antropologa italiana

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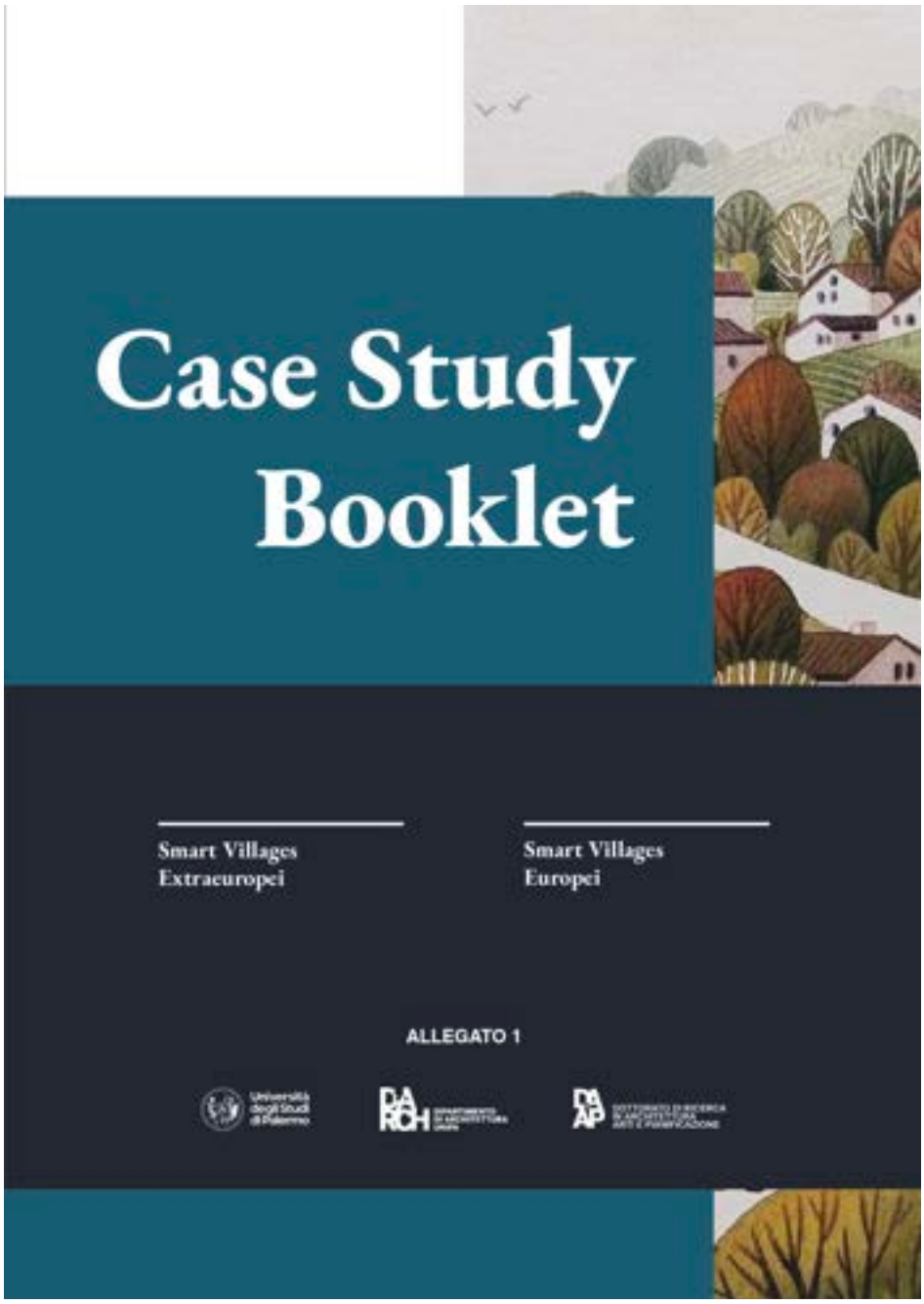

Fig. II | Comune di Gangi © Carmelo Di Salvo, 2021

Capitolo II

LE AREE INTERNE IN SICILIA E IL COMPRENSORIO MADONITA. VERSO LA COSTITUZIONE DI UNA RETE DI SMART VILLAGES

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Capitolo II
Abstract

IT

Il secondo capitolo della presente tesi si concentra sull'analisi approfondita del caso studio di riferimento, focalizzandosi sull'area del Parco delle Madonie, un Geopark UNESCO in Sicilia che abbraccia 21 comuni dell'area del palermitano. Attraverso un'analisi SWOT, il capitolo mira a individuare le potenzialità e le minacce intrinseche a questo territorio, ponendo le basi per la definizione di strategie innovative di sviluppo sostenibile.

Il contesto si arricchisce con la scelta di un caso pilota di concerto con la Soprintendenza ai Beni Culturali e Ambientali della Provincia di Palermo per la sua condizione di estrema marginalità e, proprio per tale motivo, caso emmblematico da analizzare con tutte le sue peculiarità, il Comune di Polizzi Generosa, selezionato in virtù della convenzione esistente tra il Dipartimento di Architettura e il Comune stesso. Questa collaborazione mira al recupero e alla valorizzazione del territorio, nonché alla progettazione sostenibile e tecnologica di soluzioni innovative. L'analisi dettagliata di questo caso offre un quadro pratico e concreto delle sfide e delle opportunità che possono emergere nella realizzazione di un villaggio intelligente.

Il capitolo procede presentando l'esperienza di tirocinio presso la Soprintendenza BB.CC.AA. della Provincia di Palermo, l'ente responsabile della tutela del territorio oggetto di studio. Questa esperienza fornisce una visione privilegiata delle dinamiche di tutela e sorveglianza che contribuiscono alla salvaguardia dei luoghi e alla promozione di pratiche di sviluppo sostenibile. Ulteriormente, si rende conto dell'esperienza all'estero, parte integrante del progetto di ricerca assegnato. Questa esperienza ha portato alla conoscenza dei principi di tutela che regolamentano le aree interne valenciane, oltre allo studio di villaggi selezionati in collaborazione con la Real Academia de Belle Artes de San Carlos de Valencia e l'UPV - Universitat Politecnica de Valencia. Questa prospettiva internazionale consente un confronto costruttivo e arricchisce la comprensione delle best practices globali e della loro possibile adattabilità al contesto siciliano.

In conclusione, il capitolo 2 si configura come un tassello cruciale nell'analisi di un contesto specifico e nella raccolta di esperienze pratiche che alimentano il percorso di ricerca e sviluppo per la creazione di *Smart Villages* nelle aree interne siciliane.

EN

The second chapter of this thesis focuses on an in-depth analysis of the reference case study, centering on the Madonie Park area, a UNESCO Geopark in Sicily encompassing 21 municipalities in the Palermo region. Through a SWOT analysis, this chapter aims to identify the strengths, weaknesses, opportunities, and threats inherent to this territory, laying the groundwork for the definition of innovative strategies for sustainable development.

The context is enriched by the selection of a pilot case, in collaboration with the Superintendence for Cultural and Environmental Heritage of the Province of Palermo, chosen for its condition of extreme marginality. Precisely for this reason, the selected case, the Municipality of Polizzi Generosa, represents an emblematic subject of analysis with all its unique characteristics. This municipality was chosen under an existing agreement between the Department of Architecture and the local administration. The collaboration aims to recover and enhance the territory while fostering the sustainable and technological design of innovative solutions. A detailed analysis of this case provides a practical and concrete framework for understanding the challenges and opportunities involved in the creation of a Smart Village.

The chapter further presents the internship experience at the Superintendence for Cultural and Environmental Heritage of the Province of Palermo, the authority responsible for safeguarding the territory under study. This experience offers privileged insight into the dynamics of preservation and monitoring, which contribute to the protection of the area and the promotion of sustainable development practices. Additionally, the research project includes an international component, which has allowed for the study of conservation principles governing the Valencian inner areas. This was carried out through the analysis of selected villages in collaboration with the Royal Academy of Fine Arts of San Carlos in Valencia and the Polytechnic University of Valencia (UPV). This international perspective enables constructive comparisons and enhances the understanding of global best practices and their potential adaptability to the Sicilian context.

In conclusion, Chapter 2 serves as a critical cornerstone for the analysis of a specific context and the collection of practical experiences, which support the research and development pathway for creating Smart Villages in Sicily's inner areas.

ES

El segundo capítulo de esta tesis se centra en un análisis profundo del caso de estudio de referencia, enfocado en la zona del Parque de las Madonie, un Geoparque UNESCO en Sicilia que abarca 21 municipios de la región de Palermo. A través de un análisis FODA, este capítulo tiene como objetivo identificar las fortalezas, debilidades, oportunidades y amenazas inherentes a este territorio, sentando las bases para la definición de estrategias innovadoras de desarrollo sostenible.

El contexto se enriquece con la selección de un caso piloto, en colaboración con la Superintendencia de Bienes Culturales y Ambientales de la Provincia de Palermo, elegido por su condición de extrema marginalidad. Precisamente por esta razón, el caso seleccionado, el Municipio de Polizzi Generosa, representa un ejemplo emblemático de análisis, con todas sus peculiaridades. Este municipio fue seleccionado en virtud de un convenio existente entre el Departamento de Arquitectura y la administración local. La colaboración tiene como objetivo la recuperación y valorización del territorio, así como el diseño sostenible y tecnológico de soluciones innovadoras. Un análisis detallado de este caso ofrece un marco práctico y concreto para comprender los desafíos y oportunidades involucrados en la creación de un pueblo inteligente.

El capítulo también presenta la experiencia de prácticas realizada en la Superintendencia de Bienes Culturales y Ambientales de la Provincia de Palermo, la entidad responsable de la protección del territorio objeto de estudio. Esta experiencia proporciona una visión privilegiada de las dinámicas de tutela y vigilancia que contribuyen a la salvaguarda de los lugares y a la promoción de prácticas de desarrollo sostenible. Además, el proyecto de investigación incluye una componente internacional que permitió el estudio de los principios de conservación que rigen las áreas interiores valencianas. Esto se llevó a cabo mediante el análisis de pueblos seleccionados en colaboración con la Real Academia de Bellas Artes de San Carlos de Valencia y la Universitat Politècnica de València (UPV). Esta perspectiva internacional permite realizar comparaciones constructivas y enriquece la comprensión de las mejores prácticas globales y su posible adaptabilidad al contexto siciliano.

En conclusión, el Capítulo 2 se configura como un pilar fundamental en el análisis de un contexto específico y en la recopilación de experiencias prácticas que respaldan el camino de investigación y desarrollo para la creación de pueblos inteligentes en las áreas interiores de Sicilia.

LE AREE INTERNE IN SICILIA E IL COMPRENSORIO MADONITA. VERSO LA COSTITUZIONE DI UNA RETE DI SMART VILLAGES

L'approccio metodologico adottato per comprendere le dinamiche territoriali in Sicilia, e sulle Madonie, ha richiesto un'esplorazione approfondita delle aree più vulnerabili dell'isola, con un'attenzione particolare alle sfide territoriali e socio-economiche che queste affrontano. Il punto di partenza è stato l'identificazione e l'analisi di queste aree vulnerabili, mediante una valutazione dettagliata dei dati geografici, socio-economici e ambientali, mirata a individuare le aree maggiormente esposte a difficoltà di vario genere ed anche economiche. Per definire le aree interne, sono stati utilizzati criteri precisi, considerando non solo aspetti geografici, ma anche elementi legati alle dinamiche socio-economiche. I confini di queste zone sono stati tracciati sulla base della presenza di centri abitati, delle attività economiche predominanti e delle caratteristiche ambientali, permettendo così una rappresentazione chiara del cuore del territorio siciliano e delle complessità che lo caratterizzano (De Montis et al., 2020), così come delineato da strategie precedenti.

Una fase fondamentale di questo studio ha riguardato l'analisi geografica delle aree interne, con la mappatura dettagliata di elementi come la morfologia del territorio, la disponibilità di risorse naturali e l'accessibilità tramite reti stradali e trasporti pubblici. Questa ha evidenziato il legame tra geografia fisica e sfide socio-economiche, fornendo un quadro completo delle variabili territoriali. Tale attenzione nasce dalla consapevolezza che la Strategia Nazionale Aree Interne (SNAI) non ha sempre valorizzato in egual misura i comuni coinvolti e le aree rurali, poiché ha spesso privilegiato indicatori quantitativi, trascurando dati qualitativi essenziali per descrivere appieno la realtà di questi territori (Armiero, 2021).

In questo contesto, la Sicilia si distingue con le sue numerose aree marginali che, secondo dati ISTAT, rappresentano circa il 70% del territorio insulare. L'attenzione alla Sicilia riflette l'importanza di adattare le strategie nazionali a specificità locali, rivedendo i criteri di inclusione e ampliando l'analisi ad altre aree considerate marginali, per rispondere più adeguatamente alle esigenze di queste comunità (Ciampa et al., 2020).

Le Aree Interne Siciliane rappresentano le zone più remote dell'isola, caratterizzate da una bassa densità abitativa e, per questo, inserite nella Strategia Nazionale per le Aree Interne (SNAI) a partire dal 2015. Per la programmazione 2014-2020 e 2021-2027, queste includono Calatino, Nebrodi, Sicani, Valle del Simeto e Madonie[1] poichè preziose e perchè meritano una rinascita e una valorizzazione adeguata. Nel dettaglio (vedi *Fig. 1*):

Il Calatino è una regione montuosa situata nella parte sud-occidentale della Sicilia. È una delle zone più selvagge e incontaminate dell'isola, e ospita una ricca varietà di flora e fauna. Le montagne sono attraversate da numerosi sentieri escursionistici, che offrono viste spettacolari sulle valli e sui paesi circostanti. Alcuni dei paesi più importanti del Calatino sono: Caltagirone, Mazzarino, Gela, Vittoria, Acate, Santa Croce Camerina, Ragusa, Modica, Ispica, Pozzallo, Comiso.

I Nebrodi sono un gruppo di montagne situato nella parte settentrionale della Sicilia. Sono una delle zone più selvagge e incontaminate dell'isola, e ospitano una ricca varietà di flora e fauna. Le montagne sono attraversate

[1] La Strategia Nazionale per le Aree Interne(si apre in una nuova finestra) (SNAI), avviata con il ciclo 2014-2020, nasce per contrastare il declino demografico che caratterizza una porzione significativa del Paese, assicurando a tutti il pieno accesso ai diritti essenziali di cittadinanza (trasporto pubblico locale, istruzione e servizi socio-sanitari) e favorendo lo sviluppo economico. È definita come strategia territoriale, sostenuta da risorse nazionali, prioritariamente indirizzate a interventi sui servizi essenziali, e da fondi europei (FESR, FSE e FEASR), per il finanziamento di progetti di sviluppo locale. Nel ciclo 2014-2020 sono state selezionate 72 aree interne.
In Sicilia, e per le Madonie, sono stati finanziati un totale di 12,7 milioni di euro nei settori Trasporti e mobilità, Reti e servizi digitali e, infine, Cultura e turismo. Rimangono senza fondi Ricerca e innovazione, Competitività delle imprese, Energia, Ambiente, Occupazione e Lavoro. La natura dell'investimento serve per l'acquisto di beni e servizi e, nella misura maggiore per le infrastrutture, ad oggi primo vincolo per il raggiungimento dei territori, specialmente per le Alte Madonie.
[OpenCoesione. (n.d.). Area Interna Sicilia Regione. https://opencoesione.gov.it/it/dati/strategie/AI/sicilia-regione/]

da numerosi sentieri escursionistici, che offrono viste spettacolari sulle valli e sui paesi circostanti. Alcuni dei paesi più importanti dei Nebrodi sono: Capo d'Orlando, Patti, Mistretta, Sant'Angelo di Brolo, Santo Stefano di Camastra, Troina, Randazzo, Bronte.

I Sicani sono una regione montuosa situata nella parte sud-occidentale della Sicilia. Sono le montagne più antiche dell'isola, e ospitano una serie di siti archeologici risalenti alla preistoria. I Sicani sono anche una destinazione popolare per gli amanti della natura, grazie ai suoi paesaggi mozzafiato e alla sua ricca biodiversità.

Alcuni dei paesi più importanti dei Sicani sono: Caltanissetta, Enna, Agrigento, Caltanissetta, Nicosia, Serradifalco, Milena, Pietraperzia

La Valle del Simeto è una valle situata nella parte orientale della Sicilia. È una delle zone più fertile dell'isola, e ospita una ricca varietà di colture, tra cui vigneti, oliveti, agrumeti e cereali. La valle è attraversata dal fiume Simeto, che è il più lungo dell'isola. Alcuni dei paesi più importanti della Valle del Simeto sono: Catania, Paternò, Misterbianco, Belpasso, Adrano, Biancavilla, Gravina di Catania, Lentini.

Infine, le Madonie, oggetto di ricerca, sono un altro gruppo di montagne situate nella Sicilia settentrionale. Sono altrimetricamente più basse dei Nebrodi, ma non meno belle. Le montagne sono ricche di boschi, foreste e laghi, e ospitano una varietà di animali selvatici, tra cui cervi, caprioli, volpi e cinghiali. Sono anche una destinazione popolare per gli sport invernali, grazie alle sue numerose piste da sci nel pianoro di Piano Battaglia, la montagna per i palermitani.

Queste sono solo alcune delle tante bellezze che si possono trovare nelle cinque aree interne siciliane (Bagnasco, 1977). Questi luoghi offrono un'affascinante prospettiva sulla vita autentica siciliana e costituiscono un'opportunità unica per immergersi nella natura, conoscere la cultura locale, incontrando persone il più delle volte genuine e ospitali. Alle seguenti aree sopra menzionate, sono state poi aggiunte aree nuove[2] nel ciclo di programmazione successivo considerate marginali o soggette a rischio tra cui: Corleone, Troina, Bronte, Val Demone, Val Belice E Val Di Mazara.

Nel 2022 è stato aggiunto anche un progetto speciale per le isole minori italiane, che coinvolge 35 comuni nel complesso. In Sicilia, il progetto speciale SNAI riguarda anche le isole (Programmazione SNAI 2021-2027), in particolare:

- **arcipelago delle Pelagie** (Isole di Lampedusa e Linosa);
- **arcipelago delle Isole Eolie** (Isole Lipari, Salina; Vulcano; Stromboli; Panarea; Alicudi e Filicudi);
- **arcipelago delle Egadi** (Isole Favignana, Levanzo e Marettimo).

Queste selezionate sono caratterizzate da una forte vocazione turistica, ma sono anche tra le più remote e meno popolate della Sicilia, a causa, in-

Fig. II.1 | Aree interne siciliane secondo la SNAI. ©Luisa Lombardo, 2023.

[2] Le Aree di progetto del ciclo di programmazione 2021-2027 includono:
- le 56 nuove Aree 2021-2027, che complessivamente coinvolgono 764 Comuni (dato al 2020), e in cui risiede una popolazione pari a 2.056.139;
- le 37 Aree identificate nel 2014-2020 che sono state confermate senza alcuna variazione del perimetro iniziale: si tratta di 549 Comuni in cui risiede una popolazione pari a 977.279 abitanti;
- le 30 Aree identificate nel 2014-2020 che presentano un nuovo perimetro rispetto alla configurazione originaria a seguito dell'annessione e/o esclusione di comuni: in questo caso si tratta di 556 Comuni in cui risiede una popolazione pari a 1.324.220 abitanti:
- il "progetto speciale Isole Minori" che coinvolge i 35 Comuni sui quali insistono le Isole, con una popolazione totale di 213.093 abitanti.

Complessivamente si tratta quindi di 124 Aree di progetto, che coinvolgono 1.904 Comuni, in cui vivono 4.570.731 abitanti.
[Dipartimento per le Politiche di Coesione. (n.d.). Le aree interne 2021-2027. https://politichecoesione.governo.it/it/politica-di-coesione/strategie-tematiche-e-territoriali/strategie-territoriali/strategia-nazionale-aree-interne-snai/le-aree-interne-2021-2027/]

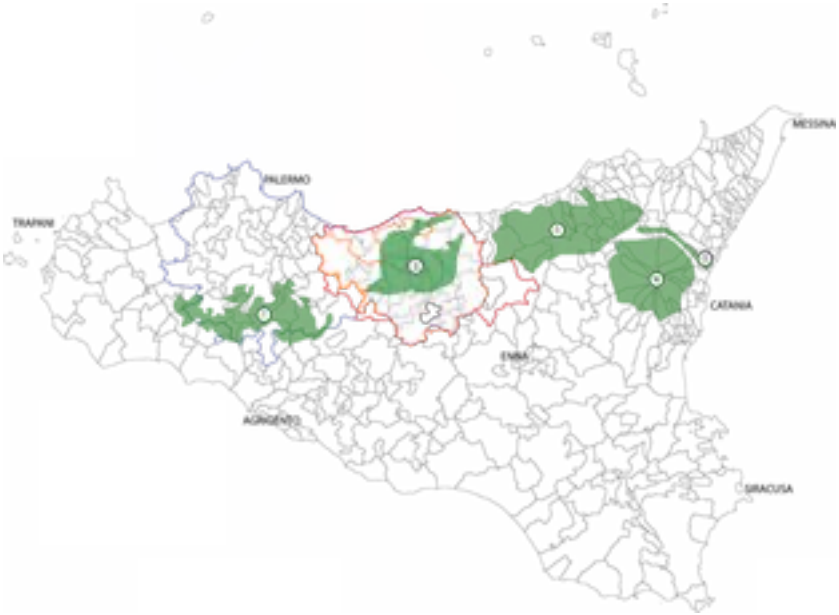


Fig. II.2 | I parchi siciliani ©Luisa Lombardo, 2022.

1. Parco dei Monti Sicani (40.000 ha);
2. Parco delle Madonie (39.941 ha);
3. Parco dei Nebrodi (86.000 ha);
4. Parco dell'Etna (59.000 ha);
5. Parco fluviale dell'Alcantare (1.900 ha).

fatti, della loro decentralizzazione, si considerano marginali; basti pensare a come queste si spopolano durante l'inverno, ovvero in bassa stagione, e come queste siano condizionate dalle condizioni climatiche avverse. Il progetto SNAI mira a promuovere lo sviluppo sostenibile di questi territori, attraverso il miglioramento delle infrastrutture e dei servizi, la valorizzazione delle risorse naturali e culturali, e il sostegno alle attività economiche locali.

I criteri di selezione delle seguenti aree sono stati effettuati rispetto a:

- il loro potenziale di sviluppo economico e sociale;
- la densità di popolazione;
- il livello di disoccupazione;
- la percentuale della popolazione in età scolare;
- la presenza di infrastrutture e servizi.

Uno dei tratti distintivi delle Aree Interne, soprattutto in Sicilia, oltre alla presenza di piccoli insediamenti abitativi e depopolamento, è la loro bellezza naturale (*Fig. 2*). La maggior parte delle aree interne siciliane, infatti, è caratterizzata da paesaggi mozzafiato, che spaziano dalle colline ricoperte di uliveti e vigneti fino alle maestose vette montuose[3], ne è un esempio il Grande Parco delle Madonie (Antista, 2011), area oggetto di studio lambita da 21 piccoli comuni siciliani. Queste generose terre regalano prodotti agricoli di alta qualità, come olio d'oliva, formaggi, vini pregiati e prelibatezze culinarie tipiche, oggi considerati prodotti della catena di *Slow Food*. La storia e la cultura di queste regioni, inoltre, risalgono a tempi antichissimi. Sono

[3] Pizzo Carbonara è la montagna più alta delle Madonie, un massiccio montuoso situato nella parte settentrionale della Sicilia. Con i suoi 1.979 metri di altitudine, è la seconda montagna più alta della Sicilia dopo l'Etna. Si trova nel territorio del Comune di Isnello, a sud della famosa cittadina turistica di Cefalù. È composto da un massiccio calcareo, con pareti a strapiombo e versanti scoscesi. La sua cima offre una vista panoramica mozzafiato sulle Madonie, sul Golfo di Palermo e sul Mar Tirreno. In giornate limpide è possibile vedere anche l'Etna e le altre montagne della Sicilia.È una meta molto popolare per gli escursionisti. Il percorso di salita è impegnativo, ma offre una grande soddisfazione per chi raggiunge la cima.
[Wikipedia. (n.d.). Pizzo Carbonara. In Wikipedia. Retrieved August 9, 2024, from https://it.wikipedia.org/wiki/Pizzo_Carbonara]

Fig. II.3 | Area del Parco delle Madonie e Comuni delle Madonie. ©Luisa Lombardo, 2022.

1. (in verde scuro) Aree ultraperiferiche;
2. (in verde) Aree periferiche;
3. (in verde chiaro) Aree intermedie.

tantissimi i paesi che conservano ancora le tracce del passato, con i loro vicoli acciottolati, le chiese storiche e i castelli medievali che si ergono sulle colline e che raccontano storie di dominazioni e influenze diverse, dando vita a una miscela unica di tradizioni e usanze locali (Caruso et al., 2001).

Tuttavia, nonostante la loro bellezza e autenticità, le Aree Interne Siciliane affrontano diverse sfide, prima tra tutti lo spopolamento.

Parallelamente all'analisi geografica, è stata condotta poi un'approfondita valutazione socio-economica, concentrata, tuttavia sull'analisi del caso studio identificato, ovvero il Parco delle Madonie (*Fig. 3*) e i suoi 21 comuni afferenti. Questa fase ha coinvolto la raccolta e l'analisi di dati relativi al reddito medio, all'occupazione, all'istruzione e altri indicatori socio-economici. L'obiettivo è comprendere la struttura economica delle aree interne, identificando le attività economiche predominanti e individuando eventuali settori di sviluppo potenziale (Cedrini, 2006). Risulta, infatti, necessario aggiornare dati e analizzare per avere un quadro completo della situazione monitorando lo stato attuale.

L'analisi effettuata in tutta la Sicilia, frutto anche della collaborazione dei dottorandi del Dipartimento di Architettura, Università degli Studi di Palermo, legata al Progetto "Notte Europea dei Ricercatori 2023"[4], legata al tema delle aree interne in Sicilia, ha messo in luce tutte le ricerche effettuate sul tema e per ambiti disciplinari differenti come urbanistica, restauro, design, oltre all'architettura tecnica. I grafici mostrano, infatti, l'andamento demografico, la perifericità di queste aree e la diminuzione percentuale di popolazione (*Fig. 4, 5, 6*). Aree che coprono quasi il 50% della superficie isolana in cui la mancanza di infrastrutture adeguate, la difficoltà di accesso e l'emigrazione giovanile rappresentano alcune delle problematiche che minacciano la vitalità di queste comunità[5]. Inoltre, la promozione turistica siconcentra principalmente sulle località costiere, trascurando spesso le ricchezze nascoste delle regioni interne, più autentiche (Barca, 2018).

Un altro aspetto cruciale della metodologia è stata l'analisi delle considerazioni ambientali. Le aree interne spesso presentano un patrimonio naturalistico nonché architettonico (*Fig. 4*) significativo, e la valutazione dell'impatto ambientale delle attività umane è stata integrata nell'analisi. Ultimo, ma non per importanza, l'analisi dei fondi spesi nella strategia SNAI a vantaggio dei territori per avere consapevolezza dei percorsi intrapresi e delle progettualità attuate, in fieri e da sviluppare nell'area (*Fig. 7*). Questo approccio olistico, tra parametri differenti e con un approccio quantitativo e qualitativo, ha permesso di individuare le potenzialità di sviluppo sostenibile, conciliando le esigenze economiche con la salvaguardia dell'ambiente.

La comprensione approfondita delle vulnerabilità e delle potenzialità delle aree ha fornito una base solida per lo sviluppo di strategie mirate e sostenibili, ma soprattutto compatibili. L'obiettivo ultimo è contribuire al riequilibrio territoriale e alla valorizzazione delle risorse delle aree interne, alimentando uno sviluppo integrato e armonioso delle aree oggetto di studio, ma anche della Sicilia nel suo complesso.

Questo consentirà, a partire da ciò che è presente o meno, di stabilire e analizzare le basi per creare una rete di *Smart Villages* nell'area oggetto di studio.

[4] [Università degli Studi di Palermo. (2023). SHARPER 2023. https://www.unipa.it/SHARPER-2023/]

[5] Peraltro il sito OpenCoesione dell'Agenzia della coesione territoriale evidenzia un quadro nel quale le difficoltà a spendere sono di tutte le politiche pubbliche, non solo quelle fondate sul "dialogo sociale". E sempre sul sito dell'Agenzia è verificabile che il tempo medio di programmazione per ciascuna area pilota seguita dalla Snai è di due-tre anni. Un tempo forse non così lungo per costruire delle risposte a problemi ai quali fino ad oggi non si è riusciti a dare soluzione. Inoltre, uno studio della London School of Economics (Crescenzi, Giua, Sonzogno, 2021) ha recentemente mostrato come sia possibile costruire un impianto operativo moderno ed efficace di politiche pubbliche sulla base delle evidenze e dell'esperienza maturata dalla Snai, che sia capace di aprirsi al contempo alla società civile e a quella produttiva, ai direttori della sanità e dell'istruzione, ai portatori di istanze nelle aree metropolitane e agli attori che possono fare la differenza nella transizione ecologica e digitale.

Luisa Lombardo
XXXVII Ciclo di Dottorato

ANALISI SOCIO DEMOGRAFICA DELLA SICILIA

Fig. II.4, 5, 6 | Andamento demografico, Livello di perifericità, Diminuzione percentuale popolazione ©Luisa Lombardo, Alejandro Gana, Derireè Saladino, Fabrizio Giuffrè e Samuele Morvillo, 2023.

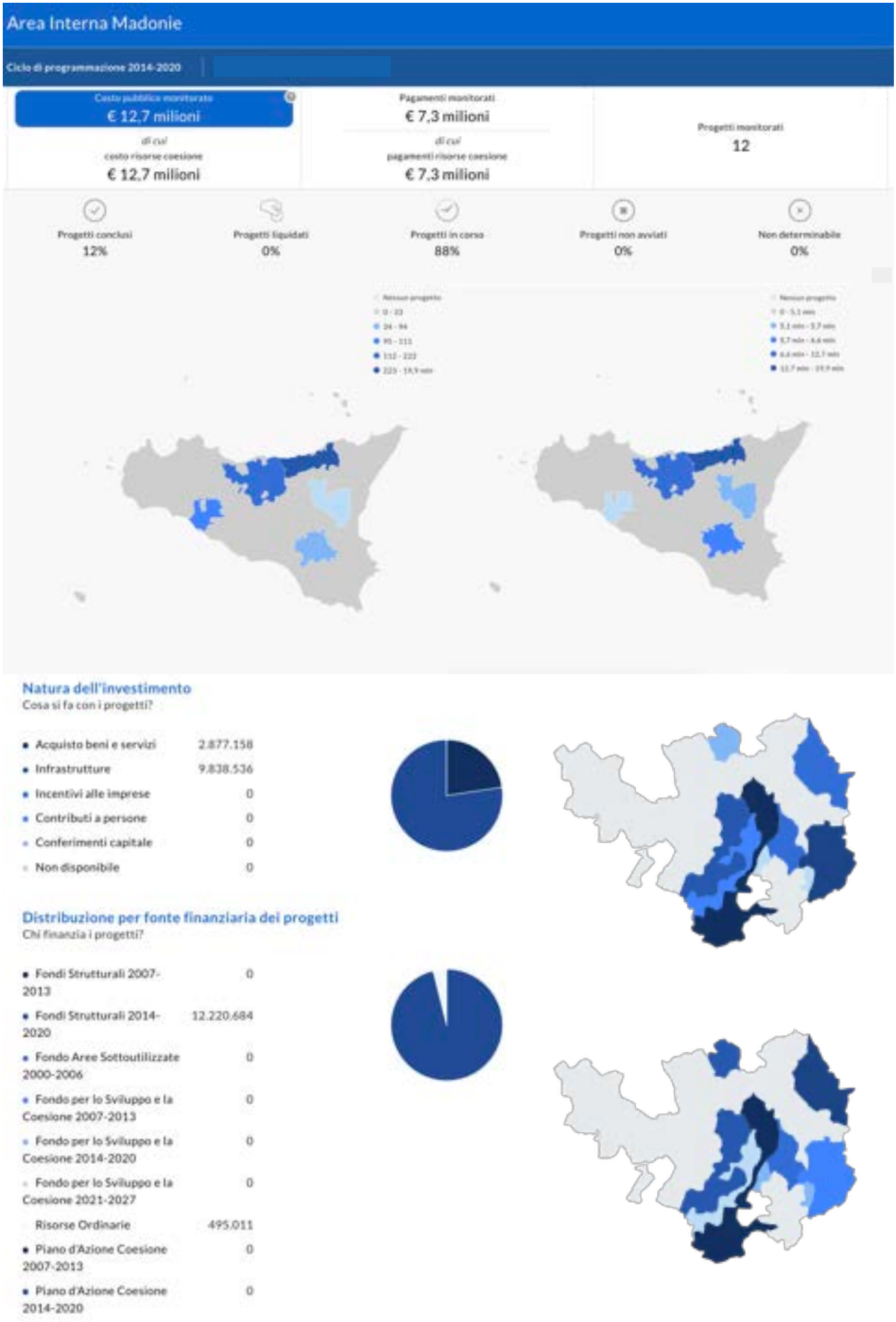


Fig. II.7 | Fonte: OpenCoesione. (2024). Area Interna Sicilia Regione. https://opencoesione.gov.it/it/dati/strategie/AI/sicilia-regione/

II.1 Le aree interne e i 21 centri minori delle Madonie

Il focus della Ricerca riguarda, in particolare, l'area centrale della Sicilia e, in particolare, il comprensorio Madonita, che in termini dimensionali, insieme ai suoi 21 comuni, è la più vasta delle Aree Interne presenti in Sicilia, seguita dai Nebrodi, dal Calatino, dai Sicani e, infine, dalla Valle del Simeto.

L'intero enclave delle Madonie è situato all'interno del Parco delle Madonie, un gruppo montuoso posto nella parte centro-settentrionale della Sicilia, appartenente alla provincia di Palermo. Insieme ai Monti Nebrodi e ai Monti Peloritani, forma quello che è conosciuto come l'Appennino Siculo, un polmone verde di importanza cruciale per l'approvvigionamento idrico (Farinella, 2010) dell'isola.

Nel 1981, il Parco delle Madonie è diventato un'area protetta, seguito dalla creazione dell'Ente Parco delle Madonie istituito nel 1989 con la Legge Regionale n. 9 del 26 marzo. Il Parco delle Madonie è stato riconosciuto come Geopark UNESCO[1] nel 2015, diventando il primo Geopark italiano ad entrare a far parte della rete globale. Il riconoscimento è stato ottenuto grazie al valore geologico, geomorfologico e naturalistico del territorio del Parco. Questo pone le basi per un approccio specifico e con un'attenzione particolare alla componente naturalistica che ne fa una delle aree più ricche del Mediterraneo.

[1] Il Geoparco delle Madonie UNESCO Global Geopark si trova in Sicilia, nel cuore del Mediterraneo, tra i più bei paesaggi di particolare interesse sia dal punto di vista geologico e geomorfologico, sia dal punto di vista didattico. Nel corso del tempo non c'è stata nessuna guida alla Sicilia o all'Italia che non abbia dedicato decine di pagine alle Madonie. Rappresenta quasi tutti gli aspetti della geologia siciliana, ha una storia molto complessa iniziata oltre 220 milioni di anni fa, ed è composta principalmente da calcare dolomitico che evoca mondi sconosciuti e scomparsi. Interessanti morfologie carsiche, sia in superficie che nel sottosuolo, si sono sviluppate più recentemente, 23,5 milioni di anni fa.
La sua posizione nella parte centrale dell'Appennino siciliano, il suo assetto geologico-strutturale e i processi morfo-dinamici che agiscono in esso fanno di questo gruppo montuoso un'area fondamentale per la conoscenza e la ricostruzione della storia geologica della catena appennino-maghrebina e quindi del Me-

Fig. II.1.1 | Sicilia e area SNAI delle Madonie. ©Luisa Lombardo, 2022.

diterraneo centrale. Per queste caratteristiche, le Madonie hanno costituito e continuano a costituire un'area di studio eccezionale, nonché una "palestra" didattica per generazioni di studenti universitari in scienze geologiche e storia naturale. L'area contiene sette tipi di formazioni accettate dalla comunità scientifica internazionale e più di quaranta geosites. La recente tettonica rende l'area anche un ottimo campo di allenamento sui geo-rischi.
Le Madonie UNESCO Global Geopark conserva anche un patrimonio naturale molto ricco e raro. In un'area molto piccola, circa il 2% della superficie della Sicilia, cresce oltre la metà delle specie della flora più evoluta: circa 2.600 piante, quasi lo stesso numero delle specie presenti in Egitto, Tunisia e Algeria. Nelle Madonie sono presenti anche centinaia di piante endemiche uniche al mondo, di cui spesso sono pochissimi esemplari, a rischio di estinzione. Il più noto e più "corteggiato" è l'abete dei Nebrodi, ma ce ne sono molti altri. Altrettanto interessanti sono i segni lasciati dall'uomo nel paesaggio: campi, corsi d'acqua, villaggi e frazioni testimoniano i mille modi in cui le comunità hanno vissuto nelle Madonie, lasciandovi impronte indelebili ed esprimendo le ragioni intrinseche di una cultura.
[Parco delle Madonie. (2022). Geoparco delle Madonie - Patrimonio UNESCO. https://www.parcodellemadonie.it/geoparco-delle-madonie-patrimonio-unesco/]

Fig. II.1.1.1 | Esemplare di Abies Nebrodensis. ©2023, Wikipedia

Fig. II.1.1.2 | Castello dei Ventimiglia a Castelbuono. ©2021, Carmelo Di Salvo

II.1.1 Inquadramento storico-territoriale

Le Madonie costituiscono un territorio ricco di storie tra antichi paesi medievali, foreste secolari, cantine, pascoli, valli, colline e campi di grano. È considerata una delle aree protette di maggiore pregio naturalistico, paesaggistico e storico-culturale della Sicilia, con più di 24 itinerari escursionistici alla portata di tutti, grandi e piccini, raccoglie specie naturali, faunistiche e floristiche di grande pregio.

Percorsi che permettono di raggiungere la seconda vetta più alta della Sicilia, da dove è possibile godere di vaste panoramiche che si estendono fino alle Isole Eolie, all'Etna, ai monti dell'Ennese e dell'Agrigentino, data la centralità dell'area. La cima più alta è Pizzo Carbonara, che con i suoi 1.979 metri sul livello del mare e rappresenta la montagna più alta della Sicilia (escludendo il vulcando dell'Etna). Da qui, è possibile osservare uno scenario che abbraccia tutta la Sicilia: da un lato i Nebrodi o Caronie verso Messina e l'Etna, guardando verso Nord-Est si possono ammirare le Isole Eolie, visibili nelle giornate di cielo terso, e verso sud le cime dei Sicani e il mare d'Africa.

In quest'area, è possibile ammirare anche gli ultimi esemplari al mondo di Abies Nebrodensis (*Fig. 1*), il famoso albero di natale, ascoltare i suoni della natura all'ombra dei boschi di agrifogli giganti di Piano Pomo, scoprire un po' di neve e imparare le tecniche per la preparazione di latticini all'interno dei piccoli pagliai rimasti ancora in piedi. Inoltre, si possono osservare piante tipiche di almeno tre continenti che convivono nello stesso ambiente.

Il Parco delle Madonie offre, infatti, paesaggi piuttosto diversi tra loro: dalla fascia costiera settentrionale si passa a quella medio-collinare per poi salire, chilometro dopo chilometro, fino alle vette più alte della parte interna che guardano verso meridione. Ogni altitudine regala panorami tutti da ammirare, con una vegetazione che varia durante le stagioni dell'anno; un habitat mediterranio in ogni sua parte. Dai prati verdi e fioriti in primavera, al *foliage* autunnale fino al bianco manto nevoso che ricopre ogni superficie durante i freddi e rigidi inverni. Luogo ideale soprattutto per gli amanti della natura e delle escursioni all'aria aperta, con numerosi sentieri tracciati, alcuni dei quali anche abbastanza semplici ed agevoli per chi non ha particolare dimestichezza con questo genere di percorsi, mentre altri più impegnativi e destinati a un pubblico più esperto o da percorrere con la sapiente presenza di guide escursionistiche (Giacomarra, 2000).

Oltre alle peculiarità naturali, le aree delle Madonie sono prevalentemente costituite da paesi con impianto medievale, caratterizzati da stradine strette e lastricate, posti in altura e in luoghi panoramici, costituiti da antiche abitazioni dalle spesse e solide mura di calcarenite, a vista o intonacate, e abbellite da balconi fioriti, fontane, chiese, piazze e luoghi iconici che si inseriscono in modo armonioso nel paesaggio (Musso, 2005).

Grazie alla loro storia e alla ricchezza che in passato ha contraddistinto questi territori, i comuni sono ricchi di beni culturali e di opere di pregevole fattura, anche se a volte risultano poco conosciuti persino agli stessi siciliani. Tra i beni culturali più conosciuti spiccano i castelli, un tempo dimore nobiliari dei feudatari che gestivano i propri terreni. Alcuni di essi, oggi, sono stati riconvertiti in musei, mentre altri purtroppo sono ridotti a ruderi. Tra i castelli meglio conservati e meglio utilizzati il Castello dei Ventimiglia a Castelbuono (*Fig. 2*). Costruito nel 1316 come torre di guardia, nel 1500 diventa residenza nobiliare, la famiglia Ventimiglia ha inoltre per secoli abitato e amministrato il distretto. Così come la cappella palatina realizzata dai fratelli Giuseppe e Giacomo Serpotta, con gli immancabili stucchi di putti e personaggi vari che riempiono tutte le pareti. Oggi il castello è sede del Museo Civico, che conserva ricche collezioni permanenti esposte nelle sezioni archeologica, urbanistica, di arte sacra e nella pinacoteca di arte moderna e contemporanea. La piazza del castello è un luogo simbolico e rappresentativo di tutta la cittadina di Castelbuono, dove si svolgono importanti festival musicali durante il periodo estivo, come il *Festival Jazz* e l'*Ypsigrock*. Altri castelli, come quelli di Pollina, Geraci Siculo, Collesano, Isnello, Polizzi Ge-

nerosa e Gratteri, purtroppo sono ridotti a ruderi, ma conservano comunque un certo fascino e ci permettono di comprendere la ricchezza del territorio anche in tempi passati. Abbondano anche le chiese barocche, ricche di marmi e stucchi che ricoprono pareti e pavimenti, con le volte affrescate e con i tipici campanili maiolicati. Polizzi Generosa, in particolare, è il paese con più beni ecclesiastici di tutto il comprensorio. All'interno del territorio (*Fig. 3*) sono presenti opere di grande prestigio di diversi autori siciliani (Brucato, 2009), tra cui lo Zoppo di Gangi.

Sono molteplici, dunque, gli itinerari che si possono intraprendere all'interno di tutto il territorio, in totale 24 (Anselmo V., 2016). In particolare, possiamo individuare tre itinerari di grande valore storico, culturale e religioso sono:

1. l'itinerario Gaginiano o dello Zoppo di Gangi[1], che permette di scoprire e ammirare i capolavori scultorei del Gagini. Attraversa i comuni madoniti tra cui: Polizzi Generosa, Petralia Sottana, Petralia Soprana, Gangi, Geraci Siculo e Pollina. I Gagini, famiglia di architetti e scultori, originari di Bissone sul Lago di Lugano, molto attivi in Liguria e in Sicilia, sono considerati tra i massimi esponenti del Rinascimento sull'isola. Il più importante artista della famiglia fu Antonello Gagini, che proprio a Palermo ha lasciato alcuni dei suoi più importanti capolavori. Pseudonimo sotto il quale hanno operato due noti autori del XVI e XVII secolo: Giuseppe Salerno (Gangi; 1570 - 1633) e Gaspare Vazzano (Gangi; 1562 - 1630). Le loro opere abbelliscono tantissime chiese dei Comuni delle Madonie. L'opera più famosa è il Giudizio Universale su tela, dietro l'altare maggiore della Chiesa Madre di Gangi ed è considerata la tela col giudizio universale più grande d'Italia;
2. l'itinerario di Frate Umile[2] (vero nome Giovan Francesco Pitorno), artista nato a Petralia Soprana. Famosi sono i suoi crocifissi lignei, che enfatizzano la drammaticità dell'evento e del dolore e che sono presenti in molte chiese in Sicilia. Tra le opere più importanti si segnalano quelle presenti all'interno della Chiesa Madre di SS Pietro e Paolo a Petralia Soprana e nella Chiesa del SS Salvatore a Gangi;
3. il percorso dei Frati sulle Madonie, inaugurato il 12 gennaio 2023 in occasione del primo anniversario della morte di Biagio Conte[3] da don Carmelo Cuttitta, vescovo di Cefalù, è un sentiero di circa 1.800 metri che inizia da Portella Colla e arriva a Piano Cervi, un luogo in cui il missionario laico Biagio Conte, fondatore della Missione Speranza e Carità, era solito ritirarsi in eremitaggio. Il percorso è facilmente accessibile e si snoda tra boschi di faggi, querce e castagni. Lungo il percorso è possibile ammirare la bellezza della natura delle Madonie e conoscere la storia di Biagio Conte. Il percorso è un modo per ricordare la sua opera di carità e solidarietà. È anche un modo per conoscere la bellezza delle Madonie e per apprezzare la natura incontaminata di questo luogo;
4. Ad aggiungersi, il sentiero dei Briganti, un percorso storico di circa 100

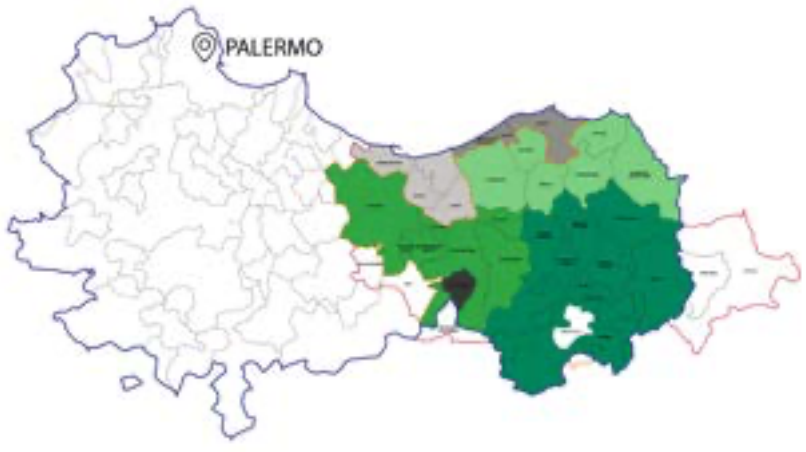


Fig. II.1.1.3 | Area delle Madonie e Provincia di Palermo. ©2021, Luisa Lombardo

[1]L'"Itinerario Gaginiano" coinvolge quattro Comuni delle Madonie – Gangi, Geraci Siculo, Petralia Sottana, Petralia Soprana – ed è il percorso migliore per avvicinarsi alle opere della dinastia dei Gagini, ma anche ai giacimenti naturali e culturali compresi tra i quattro centri. Il percorso mette insieme opere d'arte della famiglia Gagini, quelle ritenute tra le più rappresentative, in quattro Comuni: la Madonna della Catena (XVI sec. Scuola gaginiana) della Chiesa della Catena a Gangi, la Cona marmorea (XV sec. Antonello Gagini) della Chiesa di S. Bartolomeo a Geraci Siculo, la Cona marmorea (XVI sec. Gian Domenico Gagini) della Chiesa di S. Maria di Loreto, a Petralia Soprana e il Retablo marmoreo (XVI sec. Gian Domenico Gagini) della Chiesa della SS. Trinità alla Badia, a Petralia Sottana.

[2]Fra Umile da Petralia ed i suoi 33 crocifissi, cosi si individua la sua esperienza artistica e religiosa da frate con la rappresentazione del Crocifisso, policromo in legno. La sua produzione si articola tra l'inizio del cinquecento e l'inizio del seicento, le caratteristiche dei crocifissi sono i giri delle spine, il sangue dal costato, le percosse che tutte insieme mettono in evidenza la narrazione della passione. Grazie alla frequentazione dei francescani riformati nel novembre 1623 entrò nell'ordine. Dopo un anno di noviziato nel convento di Mistretta (sui Nebrodi), venne ordinato frate, con il nome di Umile da Petralia. Il numero dei crocifissi è 33 come gli anni della vita di Gesù, e nel corso della storia sono stati tantissimi i desiderosi di far apparire la sua opera come frutto di un dono divino, o da un presunto voto attribuito al Frate scultore itinerante. All'inizio del seicento si incominciano a vedere i primi crocifissi lignei con indicazioni prese a piene mani dai francescani, su disposizione di Leone X, papa nel 1513 ed in Sicilia nascono le prime scuole di intagliatori.

[3] Biagio Conte è stato un missionario laico e filantropo italiano, noto per la sua straordinaria dedizione all'opera di carità e solidarietà. Nato a Palermo il 16 settembre 1963, ha dedicato gran parte della sua vita a servire gli altri, in particolare le persone meno fortunate e svantaggiate. La sua opera più riconosciuta è stata la fondazione della "Missione Speranza e Carità," un'organizzazione impegnata nell'aiutare i bisognosi, i senzatetto e gli emarginati. Ha lavorato instancabilmente per fornire cibo, alloggio e supporto ai più vulnerabili della società, dimostrando una generosità e una compassione straordinarie. La sua vita è stata caratterizzata dalla semplicità e dalla dedizione alla causa della carità. L'opera di Biagio Conte ha avuto un impatto significativo sulle vite di molte persone e ha ispirato altri a seguire il suo esempio di altruismo. È scomparso a Palermo il 12 gennaio 2023, all'età di 59 anni, dopo una lunga malattia. La sua eredità rimane un faro di speranza e compassione nella società contemporanea.

chilometri, da percorrere in cinque giorni, che inizia a San Mauro Castelverde, all'interno del Parco delle Madonie, e termina a Cesarò nel Parco dei Nebrodi. Nato da una ricerca storica di Giovanni Nicolosi, personalità molto attiva nel territorio, il cammino attraversa antiche trazzere e vie utilizzate dai briganti tra l'Unità d'Italia e l'assedio di Gangi nel 1926. Il percorso mira a riscoprire gli avvenimenti legati al brigantaggio, in particolare le vicende della banda maurina comandata da Melchiorre Candino e dei successivi gruppi, fino all'intervento del Prefetto Cesare Mori, che nel 1926 pose fine all'attività brigantesca con l'assedio di Gangi.

Nel territorio sono presenti anche alcuni interessanti e unici musei, come il museo di arte contemporanea sotterraneo a Petralia Soprana; caso unico al mondo di un museo all'interno di una miniera di sale attiva con sculture di salgemma.

L'area delle Madonie, divisa per altimetria (*Fig. 4*) e per peculiarità territoriale si declina in Alte, Basse e Madonie Imeresi, offre un tesoro di storie da scoprire tra antichi paesi di impianto medioevale, foreste centenarie, pascoli, valli, colline e campi di grano. Abitata fin dai tempi antichi, le sue città sono state costruite in armonia con l'ambiente naturale, lontano dalle città e dagli agglomerati industriali tanto da potersi definire, oggi, architettura vernacolari per l'uso di materiali locali e per i centri abitati che per i beni isolati che arricchiscono l'immenso e variegato territorio.

Questo ha contribuito alla preservazione dei valori materiali, tecnologici ed estetici della regione. La rilevanza paesaggistica, ambientale ed architettonica dell'area lambisce circa ventuno centri urbani densi di storia e cultura, sufficientemente uniformi nei caratteri di aggregazione, architettura e costruzione. L'omogeneità dei centri urbani è il risultato di una radicata tradizione locale e di un'unità culturale, nonchè di una storicità che ha unito l'area per oltre tre secoli (Regione Siciliana, 2005).

Negli ultimi decenni, l'area delle Madonie ha continuato a sviluppare progetti e programmi per migliorare l'accessibilità e la produzione, registrando un incremento delle attività artigianali ed industriali. Questo ha portato a una parziale crescita dell'attività a discapito del settore edilizio, non sempre di qualità, ma al contrario rimasto fermo al passato e ai margini ed all'interno dei centri storici.

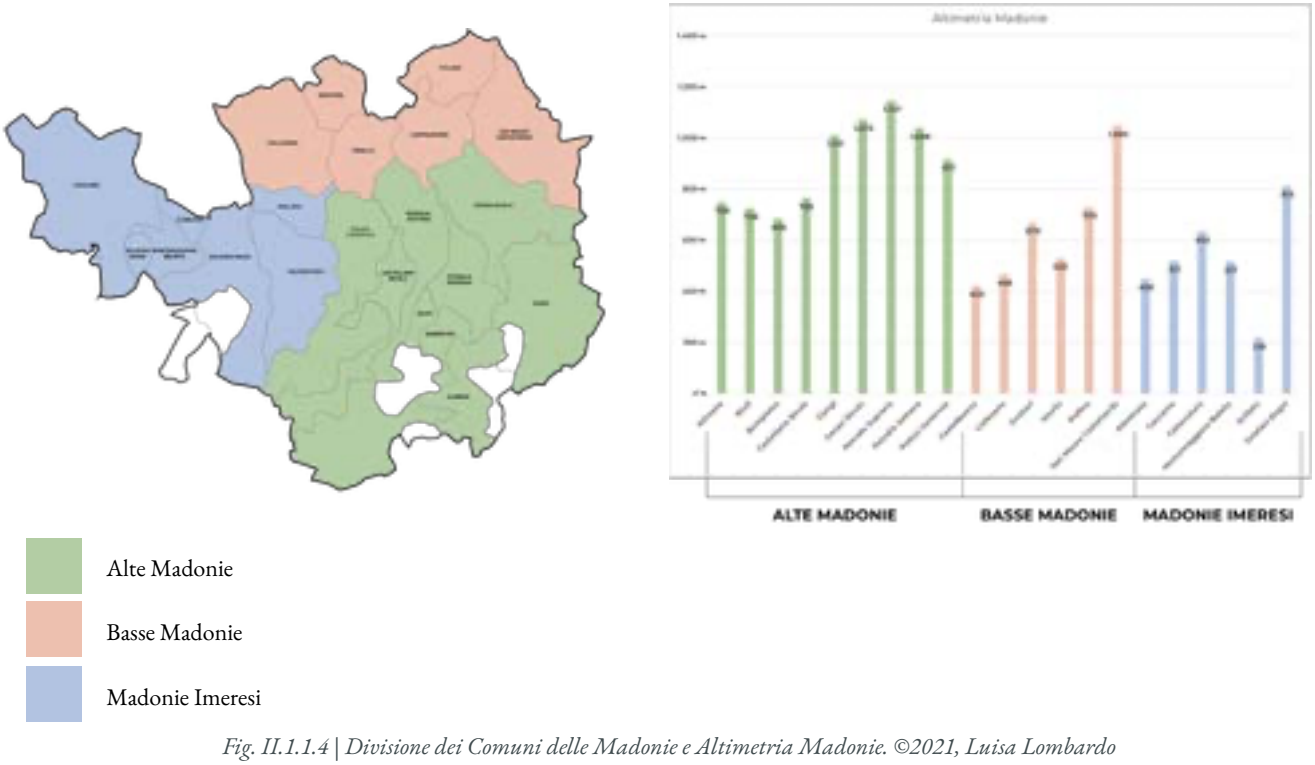


Fig. II.1.1.4 | Divisione dei Comuni delle Madonie e Altimetria Madonie. ©2021, Luisa Lombardo

II.1.2 L'evoluzione prima e dopo la SNAI

I ventuno comuni del Parco delle Madonie, appartenenti alla provincia di Palermo, negli ultimi anni, nella speranza di dare un futuro alle generazioni prossime, hanno affrontato diverse sfide nel ricercare forme aggregative più opportune per promuovere un rinnovamento locale. Inizialmente il numero minore pian piano hanno ampliato collaborazioni e si sono uniti per favorire lo sviluppo complessivo dell'area.

I Gruppi di Azione Locale[1] (G.A.L.)[2], ad esempio, sono delle iniziative di associazione locale il cui obiettivo principale è strutturare e mettere in atto una strategia partecipativa di sviluppo di un'area rurale attraverso un approccio *bottom-up*, ovvero partendo dalle esigenze specifiche del territorio. A livello giuridico, si tratta spesso di enti di diritto privato, come i consorzi, che comprendono al loro interno sia soggetti privati che pubblici. Questi ultimi in una quota che non deve superare il 49%. Anche se non necessariamente vengono definiti con strutture predefinite, potrebbero ad esempio costituirsi come un partenariato con un ente capofila. Vengono cofinanziati con il supporto di fondi europei, nazionali e regionali. Proprio attraverso questi fondi, i GAL programmano e incentivano lo sviluppo rurale, attraverso la redazione di un piano di azione locale (Cicero Bellizza, 2017).

Il GAL Madonie[3], costituito nel 2007, con sede a Castelbuono, ha come obiettivo la promozione dello sviluppo rurale del comprensorio, attraverso la realizzazione di progetti che riguardano l'agricoltura, l'agroalimentare, il turismo, l'artigianato e l'ambiente. Il comprensorio inizialmente comprendeva 12 comuni, col passare degli anni è giunto fino a 34 unità.

Ha realizzato negli anni numerosi progetti di sviluppo rurale, che hanno contribuito a migliorare la qualità della vita dei cittadini del comprensorio e a promuovere l'attrattività turistica delle Madonie:

- **progetto "Madonie in Tasca":** progetto di promozione del turismo enogastronomico del comprensorio delle Madonie;
- **progetto "Madonie a Pedali":** progetto di promozione del turismo sostenibile del comprensorio delle Madonie;
- **progetto "Madonie in Fiore":** progetto di promozione del turismo naturalistico del comprensorio delle Madonie;
- **progetto "Madonie Smart":** progetto di promozione dell'innovazione tecnologica nel comprensorio delle Madonie;
- **progetto "Madonie Cultura Accessibile":** progetto di promozione dell'accessibilità dei comuni.

Progetti avviati di concerto, ma che poi non hanno mai avuto appeal e non hanno avuto seguito.

Per dare vita a una nuova *governance* in grado di recuperare i livelli decisionali intrapresi nel territorio, tuttavia, i Comuni hanno deciso di istituire poi anche l'Unione delle Petralie (*Fig. 1*) con lo scopo di creare una progettualità condivisa e promuovere la messa a sistema delle risorse, nonchè far confluire il resto dei comuni presenti nel circondario.

Alcuni ostacoli normativi, nel corso del tempo, hanno impedito la costituzione di nuove Unioni di Comuni, mantenendo il territorio diviso per anni. Successivamente, con l'avvento della Strategia Nazionale per le Aree Interne (SNAI), sono state costituite altre due Unioni che comprendevano diciannove dei ventuno comuni dell'area: l'Unione dei Comuni Madonie e l'Unione dei Comuni Val D'Himera Settentrionale (*Fig. 2*). Infine, è nata poi l'Unione dei Comuni "Madonie"istituita nel lontano 2009, con l'obiettivo di ricomporre il territorio locale secondo logiche che consentissero di recuperare economie di scala nell'erogazione dei servizi ai cittadini e garantire una parità di rappresentanza di tutti i comuni nell'Unione, composta da 12 comuni della provincia di Palermo tra cui: Alimena, Aliminusa, Bompietro, Caccamo, Castelbuono, Castellana Sicula, Collesano, Geraci Siculo, Isnello, Polizzi Generosa, Scillato e Sclafani Bagni.

L'Unione, con un assetto organizzativo definito, sempre con sede a Castelbuono, ha come obiettivo la promozione dello sviluppo economico, sociale

[1] Sono stati definiti inizialmente durante gli anni '90 all'interno della strategia Leader (Liaison entre Actions de Développement de l'Économique Rurale, tradotto significa collegamento fra azioni di sviluppo dell'economia rurale) che aveva come principio il collegamento e la partecipazione attiva della popolazione locale presente in un territorio rurale. Durante il ciclo di finanziamento 2014-2020, il campo di azione di questo approccio è stato esteso ulteriormente allo sviluppo locale di tipo partecipativo (Community-Led Local Development, Ccld) all'interno delle zone rurali, urbane e di pesca. Ciò ha fatto sì che oltre all'utilizzo del Feasr (fondo europeo agricolo per lo sviluppo rurale) sia possibile per i Gal attingere anche al fondo europeo per gli affari marittimi e la pesca (Feamp), al fondo sociale europeo (Fse) e al fondo europeo regionale (Fesr). [*Openpolis. (n.d.). Che cosa sono i GAL (Gruppi di Azione Locale)? https://www.openpolis.it/parole/che-cosa-sono-i-gal-gruppi-di-azione-locale/*]

[2] Un Gruppo d'Azione Locale (GAL), è uno strumento promosso dall'Unione Europea per sviluppare piani e programmi di interventi dedicati al miglioramento socio-economico delle comunità rurali. I GAL sono raggruppamenti di partner pubblici e privati che rappresentano sia le popolazioni rurali, attraverso la presenza di enti pubblici territoriali (comuni, province e comunità montane), sia le organizzazioni degli operatori economici presenti nel territorio. I GAL attraverso la predisposizione e l'attuazione dei Piani d'Azione (PdA), che sono lo strumento programmatorio per la definizione e l'attivazione della strategia di sviluppo locale di ogni GAL, partecipano all'attuazione del Programma di Sviluppo Rurale (PSR) 2014-2020, il principale strumento messo in campo dalla Regione Autonoma della Sicilia per favorire lo sviluppo dell'agricoltura e dei territori rurali. Il PSR è anche lo strumento di programmazione della politica di sviluppo rurale finanziata dal FEASR (Fondo Europeo Agricolo per lo Sviluppo Rurale), che definisce, in coerenza con gli obiettivi della strategia Europa 2020, l'Accordo di Partenariato nazionale e i Programmi nazionali, gli interventi regionali per il periodo di programmazione 2014-2020.

[3] Una coalizione territoriale che ha dato vita al programma strategico "Madonie Resilienti: Laboratorio di futuro", costituendosi come Unione Comuni Madonie e come Centrale Unica di Committenza. La strategia d'area si compone più di 20 interventi progettuali distribuiti in diversi assi tematici di sviluppo locale. Per la sperimentazione del patto di integrità ne sono stati selezionati 2, considerati cruciali per lo sviluppo territoriale e l'impatto sui cittadini, l'energia (efficientamento energetico e rinnovabili) e l'istruzione la cui centrale di committenza è rappresentata da ReSMa (Rete Scolastica delle Madonie).

Fig. II.2.1.1 | Assetto territoriale delle Madonie prima della SNAI. ©2021, SNAI

1. (in rosso) Unione dei Comuni dei Ventimiglia;
2. (in arancio) Unione dei Comuni Petralie e dell'Imerese;
3. (in verde) Unione dei Comuni Porte del Parco delle Madonie;
4. (in azzurro) Unione dei Comuni Re.Al. Imera;
5. (in giallo) Unione dei Comuni di Val D'Himera;
6. (in viola) Unione dei Comuni Valdemone.

Fig. II.2.1.2 | Assetto territoriale delle Madonie dopo la SNAI. ©2021, SNAI

1. (in azzurro) Unione dei Comuni Madonie;
2. (in verde) Unione dei Comuni Val D'Himera Settentrionale.

e culturale dei comuni aderenti attraverso la gestione associata di funzioni e servizi. Le linee guida di questa *governance* sono state ulteriormente sviluppate dalla strategia "Madonie Resilienti" che abbraccia diverse tematiche, tra cui la sanità, l'istruzione, il trasporto pubblico locale e le reti digitali nonché l'unione e il network collaborativo dei comuni. Tra le iniziative proposte, vi è il mantenimento del Presidio Ospedaliero di Petralia Sottana, il potenziamento dei servizi di urgenza-emergenza, l'insediamento di nuove funzioni come la riabilitazione motoria e respiratoria, e la promozione della telemedicina. Sul fronte dell'istruzione, si mira a sviluppare la Rete Scolastica delle Madonie e a riconoscere l'Ambito Territoriale Ottimale scolastico.

Per il trasporto pubblico locale, è prevista l'introduzione di nuove corse circolari tra i comuni e tra il territorio e gli aeroporti di Catania e Palermo, mantenendo invariati i costi. Per garantire una connettività adeguata, è stata pianificata la predisposizione di banda larga e ultralarga nei comuni dell'Area Interna, con l'obiettivo di completarla entro marzo 2018, ma ancora in corso d'opera. Infine, riguardo all'Unione dei Comuni, si prevede di azzerare i costi di funzionamento a carico dei singoli comuni, grazie alle economie di scala ottenute nella connettività, nel software e nelle utenze telefoniche.

Sia il GAL Madonie che l'Unione dei Comuni (*Fig. 6*) costituiscono un importante punto di riferimento per lo sviluppo rurale del comprensorio delle Madonie (Trapani et al., 2013) per promuovere l'attrattività turistica e la sostenibilità ambientale del territorio, attraverso la realizzazione di nuovi progetti di sviluppo rurale; alla base vi è la volontà di collaborare e di fare squadra.

Ad oggi il sistema di gestione amministrativa del comparto madonita (*Fig. 3*) vede la gestione in un'ottiva piramidale in cui sono presenti, al suo vertice, il Presidente del Parco delle Madonie con il Consiglio e la Giunta, e a seguire i Sindaci con i Consigli Comunali dei vari comuni afferenti all'area, i Baby Sindaci, necessari per uno sguardo futuro al territorio seguiti dalle Consulte Giovanili e, infine, la pratica del Servizio Civile che Integra gioventù e strategie e percorsi innovativi per incentivare le attività nel territorio. Oggi, a questo assetto territoriale, si aggiungono anche altri comuni interni e un partenariato pubblico/privato per la gestione di progetti e iniziative comunitarie (*Fig. 4*).

Fig. II.2.1.3 | Parco delle Madonie ©Carmelo Di Salvo, 2022.

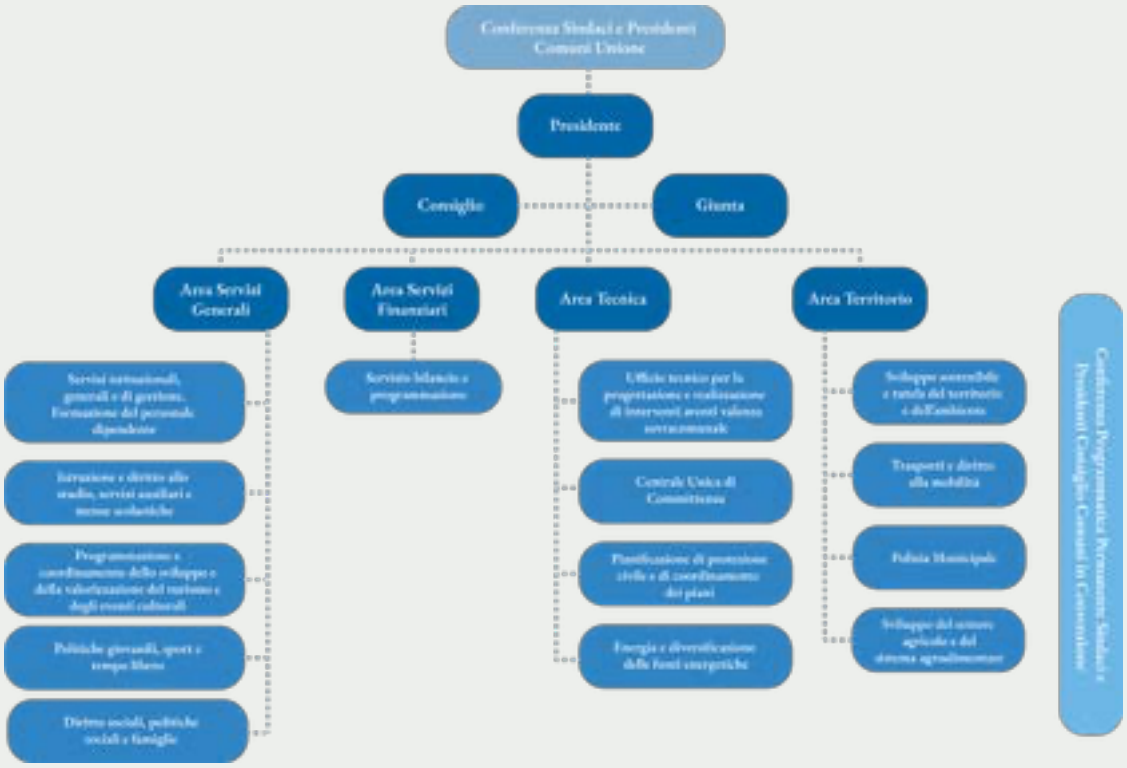


Fig. 3 | Unione Comuni "Madonie": gli assetti organizzativi. ©Luisa Lombardo, 2022

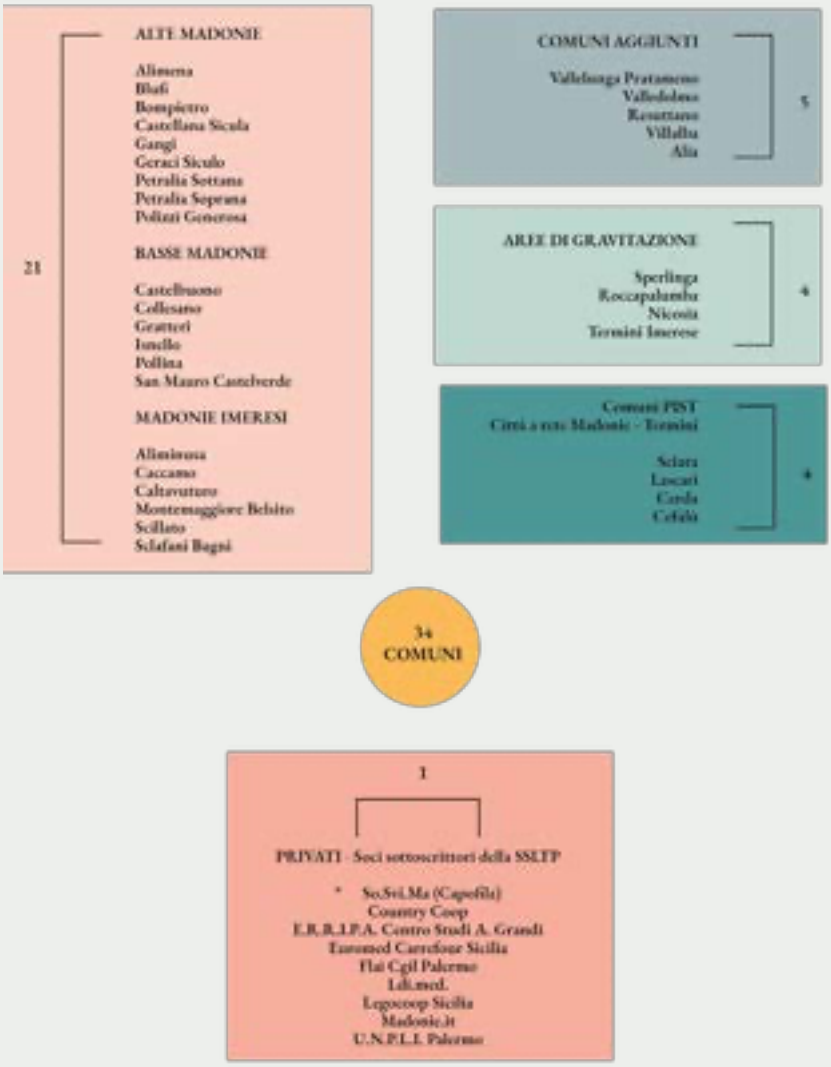


Fig. II.2.1.4 | Soci sottoscrittori al GAL Madonie. ©Luisa Lombardo, 2023

Fig. II.1.3.1 | Alimena, Parco delle Madonie. ©Luisa Lombardo, 2022

Fig. II.1.3.2 | Blufi, Comune del Parco delle Madonie. ©Luisa Lombardo, 2022

Fig. II.1.3.3 | Bompietro, Parco delle Madonie. ©Luisa Lombardo, 2022

II.1.3 Caratteri di identità locale e peculiarità materico - costruttive

Le regole del costruire nel contesto madonita sono state tramandate di generazione in generazione, come per il resto del Bacino del Mediterraneo (Bresh, 1986), e sono frutto di un rapporto equilibrato tra uomo e ambiente, ne parlano a lungo le ricerche effettuate da Fatta, Campisi, Li Castri, Lo Piccolo e Vinci sulla presenza dell'architettura di base diffusa nell'area oggetto di studio. L'abbandono di queste regole e l'adozione dei modelli delle periferie urbane ha introdotto elementi contrastanti con la cultura tecnica locale, il linguaggio architettonico e le condizioni insediative ed ambientali. Le architetture di importazione e l'edilizia di quantità, negli ultimi anni, hanno stravolto i delicati tessuti storici; pur mantenento i loro caratteri identitari, talvolta, infatti, è possibile riscontrare difformità nell'evoluzione costruttiva (Scinà, 1988). Questo è dovuto a due pulsioni di direzione opposta: la necessità di rinnovare il patrimonio edilizio e conformarlo ai bisogni di vita contemporanea, mentre dall'altro lato il desiderio di mantenere la qualità ambientale di una tradizione da non rinnegare.

Anche se alcuni interventi sono obiettivamente estranei alla storia e al linguaggio dell'architettura locale, un'attenta lettura riconosce nell'ingenuità e nell'approssimatività delle soluzioni una volontà degli abitanti di riprendere il filo del codice del luogo. Questo è evidente nella scelta della pietra (*Fig. 1*), nell'apparecchio murario a vista, nelle mostre attorno ai vani esterni e nelle ferrate dei balconi che è possibile riscontrare percorrendo le vie dei paesi (Fatta et al., 2010).

La particolare conformazione del terreno e il clima hanno influenzato il modo in cui le case sono state costruite nel corso dei secoli (*Fig. 2*). Risultano spesso raggruppate in un unico complesso, sia con una media che con un'alta densità di popolazione.

I complessi abitativi separati da vicoli tortuosi, scale, archi, slarghi e piazze, sono proprio questi alcuni dei caratteri identitari reperibili in ognuno dei ventuno centri appartenenti al comprensorio. Esistono poi diversi tipi di complessi, a seconda delle caratteristiche dell'ambiente naturale e dello sviluppo storico. Tuttavia, ci sono anche molti elementi comuni, come la compattezza dei volumi e delle architetture, e la serialità dei caratteri tipologici e costruttivi delle cellule residenziali.

Attraverso la lettura delle parti riconoscibili dell'architettura originaria, è possibile individuare il lessico costruttivo e la matrice tipologico-funzionale primigenia del patrimonio edilizio definito "minore". Questo patrimonio edilizio è rappresentativo, ancor più delle fabbriche auliche, dell'architettura dei piccoli centri montani.

L'edilizia di base nell'area delle Madonie è condizionata dai materiali da costruzione reperibili in loco, dalle cave limitrofe, e dalle tecniche costruttive adoperate, che dipendono dalle risorse locali immediatamente disponibili, dalla limitatezza dei mezzi tecnici ed economici e dalla difficoltà dei collegamenti e dei trasporti. Può essere definita l'architettura senza architetti, frutto della sapienza costruttiva diffusa ai più, soprattutto legata al mondo contadino (Castagno, 1982). Questi fattori nei secoli hanno contribuito alla definizione della tipicità dell'area, determinando risultati tecnici e formali spesso originali e introvabili in altre aree siciliane e non.

Tranne rari casi, la muratura portante è costituita da calcare compatto o quarzarenite estratti dalle numerose cave della zona. Le varietà più resistenti e di grana più fine vengono preferite per gli elementi di completamento, come i portali, le piattabande, gli stipiti, le mostre, i cornicioni, le mensole e i suoli di balconi. Le dimensioni staticamente sovrabbondanti di questi elementi sembrano giustificate per resistere ai frequenti terremoti, ma ancor più per migliorare le condizioni di benessere all'interno.

Le mura sono costruite con pietre naturali non lavorate (*Fig. 3*), il che rende la struttura meno efficiente e richiede più lavoro per costruirla.

I mattoni sono utilizzati solo in alcune aree, dove sono presenti ancora fornaci, e sono costruite secondo le regole dell'arte, mentre altrove i mattoni sono utilizzati solo per realizzare sopraelevazioni leggere, archi di scarico,

Fig. II.1.3.4 | Caccamo, Parco delle Madonie. ©Luisa Lombardo, 2022

volte sottili ed elementi di finitura e impiantistici, come cornicioni, pavimenti, tetti e condotte di scarico.

Il legno è il materiale principale per i solai (Tampone et al., 2002), che possono essere piani o inclinati nel caso di solai di copertura. I solai sono spesso realizzati con legno di latifoglie, mentre il riempimento dei campi è spesso realizzato con canne palustri, gesso o sughero. Il sughero è facilmente reperibile nelle aree boschive ed è utilizzato per alleggerire i solai, migliorando anche l'isolamento termico e acustico (Campisi, 2001).

L'acqua piovana viene raramente raccolta, ma viene spesso allontanata direttamente. Pertanto, i cornicioni sono particolarmente importanti dal punto di vista tecnico ed estetico; sono spesso formati da vari strati di coppi aggettanti, sfalsati, sovrapposti ad uno o più ordini "alla cappuccina". A volte, i vani di accesso erano protetti dall'acqua piovana con una gronda in mattoni collegata a un embrice "buttafuori" o ad un discendente in tubi a sezione tronco-conica smaltati internamente, i "catusati".

I portali e i balconi sono gli elementi più efficaci e utilizzati per completare ed abbellire una facciata. Sono formati da stipiti in blocchi di pietra squadrata collegati da piattabanda o arco. Nei piedritti viene spesso interposto un concio con funzione di indentatura alla muratura adiacente. Gli archivolti variano dalle soluzioni più comuni in pietra, con chiave prominente ed intagliata, a quelle in pietrame e mattoni disposti in coltello.

I balconi sono in pietra compatta locale e presentano aggetti conformati secondo disegni complessi ed accattivanti. Le mensole, le grate e le ringhiere in ferro e ghisa alternano disegni consueti, tratti dalla tradizione della Sicilia occidentale (*Fig. 4*).

Le forme aggregative delle edilizia diffusa nelle Madonie sono fortemente influenzate dalla giacitura del terreno e delle strade adiacenti. Le scale esterne giustapposte al corpo principale della casa, laterali o frontali con ballatoio di piano, sono state progressivamente sostituite da scale interne, a causa dell'allargamento delle sedi stradali per il passaggio delle automobili, non più solo di cavalli e carri. Quando lo sviluppo lineare dell'isolato segue la disposizione secondo la massima pendenza, il corpo di fabbrica doppio è suddiviso in alloggi ad un solo affaccio su strada, con un massimo di due elevazioni.

Al contrario, su strade pianeggianti in zone a forte pendenza, gli isolati sono costituiti per lo più da un solo corpo di fabbrica, con doppio affaccio soltanto ai piani alti, accessi su strade a diversa quota ed un accentuato sviluppo verticale delle fronti a valle. Un'altra variante aggregativa è quella "a schiera doppia" o "a spina", in cui ogni unità ha un solo lato libero e si trova in aderenza con le due unità laterali e con quella retrostante (*Fig. 5*). Questa configurazione è privilegiata nei casi di disposizione prossima all'asse nord-sud, in quanto consente l'illuminazione della fronte est nelle prime ore del mattino e della facciata esposta ad ovest in quelle pomeridiane. In caso di orografia del terreno che imponeva un'orientazione delle schiere prossima all'asse est-ovest, sembra fosse più comune la configurazione a schiera singola che garantisce l'irraggiamento della fronte a sud di tutte le unità abitative.

Le aggregazioni di tipo casuale sono diffuse, determinando una configurazione plano-altimetrica articolata - profondità ed altezza variabili dei corpi di fabbrica, geometrie distributive in pianta differenti e con volumi alternati - scandita sovente dalla presenza di "vuoti" che alleggeriscono la densa trama del tessuto urbano, quali i passaggi coperti, cortili, vicoli e slarghi. Gli spazi esterni stretti e tortuosi presentano il vantaggio di smorzare le correnti fredde, mentre in estate alternano nei percorsi zone in ombra e spazi soleggiati.

Su tutto il territorio montano madonita sono presenti sia le case ad una sola elevazione (terrana), sia a 2 piani (casa solerata). Queste cellule abitative di base hanno dato origine con la loro evoluzione spaziale (crescita volumetrica, accorpamenti, raddoppio in facciata o in profondità, ...) ad un'articolata casistica di varianti che hanno seguito le nuove esigenze ed i nuovi modelli dell'abitare.

La cellula residenziale di base più frequente al piano terra è larga in media

Fig. II.1.3.5 | Caltavuturo, Parco delle Madonie. ©Luisa Lombardo, 2022

5 metri e profonda 6-7 metri ed ha un solo affaccio su strada con funzione di accesso, illuminazione ed aerazione. Per lungo tempo essa fungeva sia da abitazione che da deposito e ricovero degli animali. La casa terrana si evolve naturalmente nella casa solerata, ottenuta con un soppalco ligneo posto a ridosso della parete di fondo, al quale si accede attraverso una scala a pioli.

La sopraelevazione delle case monocellulari a un piano comportava la costruzione di una scala esterna parallela al prospetto, chiamata "annìto". L'annìto era realizzato su un nucleo in muratura, mentre il pianerottolo era posto su una volta a botte di fattura grossolana che inquadrava e proteggeva il vano di accesso al locale terrano. Il pianerottolo dell'annìto era utilizzato come piccolo spazio all'aperto privato, un surrogato del più ricco balcone.

Le unità aggregate "a schiera", in aderenza lungo la strada, stabilivano un rapporto diretto tra lo spazio privato della residenza e lo spazio pubblico della strada. Gli slarghi ed i vicoli ciechi assumevano la connotazione di spazi aperti comuni ad una comunità ristretta, nei quali si svolgevano molte attività diurne durante i periodi più caldi.

Nel caso di aggregazioni più complesse, due o più cellule di base erano fuse con sovrapposizione o giustapposizione di due corpi edilizi limitrofi. Nell'abitazione ottenuta dalla fusione di due unità vicine un corpo era destinato a magazzino, l'altro ad abitazione con cucina al piano terra, con un eventuale ampliamento per l'alcova al piano superiore. L'aggregazione in senso verticale su tre livelli proponeva in genere al piano terra la zona non residenziale (deposito, cantina, ...), la cucina-zona giorno all'ultima elevazione, mentre la camera da letto trovava posto al piano intermedio.

Le aggregazioni tra unità adiacenti con sopraelevazione, attribuibili alla borghesia emergente, hanno determinato la formazione di "palazzetti" in condomini familiari. Tali casi arricchivano in genere il prospetto di elementi quali balconi, cornicioni e portali. Ulteriori varianti erano rappresentate da differenze tipologiche e formali che intercorrevano tra le case di testa, ad angolo e comprese all'interno della stecca edilizia (*Fig. 6*). Pur mantenendosi simili le soluzioni planimetriche degli ambienti, appariva diverso l'impaginato delle fronti architettoniche, in rapporto alle variazioni di posizione degli accessi, alla localizzazione delle scale esterne, alla presenza di pareti cieche o forate (Fatta et al., 2007).

Fig. II.1.3.6 | San Mauro Castelverde © Tania Meli, 2022

II.1.4 Divisione territoriale

Il territorio si divide, poi, secondo l'ultima strategia SNAI in Alte e Basse Madonie e Madonie Imeresi; a ciascuna area afferiscono comuni differenti.

In particolare, alle Alte Madonie (*Fig. 12*) appartengono:

- Alimena;
- Blufi;
- Bompietro;
- Castellana Sicula;
- Gangi;
- Geraci Siculo;
- Petralia Sottana;
- Petralia Soprana;
- Polizzi Generosa.

Alle Basse Madonie:

- Castelbuono;
- Collesano;
- Gratteri;
- Isnello;
- Pollina;
- San Mauro Castelverde.

Al gruppo, ultimo, delle Madonie Imeresi:

- Aliminusa;
- Caccamo;
- Caltavuturo;
- Montemaggiore Belsito;
- Scillato;
- Sclafani Bagni.

Nel grafico seguente, la divisione territoriale appena analizzata. (*Fig. 12*) Guardiani assoluti della bellezza del Parco delle Madonie, sono i suoi 21 comuni, definiti anche '*diamanti incastonati nella roccia*'. I paesi situati nelle Madonie, oltre a riflettere in qualche modo la tipica atmosfera siciliana, condividono ulteriori elementi comuni (Trapani et al., 2013). Questi si manifestano nell'architettura, nell'arte e nelle radicate tradizioni locali. La geografia e, soprattutto, la storia sottendono l'identità distintiva di questa regione, nota come "madonita". Per secoli, l'area è stata governata da una potente famiglia nobile, i Ventimiglia, la cui influenza si è tramandata visibilmente nel tempo.

Di seguito la schedatura dei ventuno comuni divisi per area del comprensorio e la descrizione delle peculiarità morfologiche, architettoniche e storiche.

Fig. II.1.4.1 | Assetto territoriale delle Madonie in Alte e Basse Madonie e Madonie Imeresi. ©Luisa Lombardo, 2022

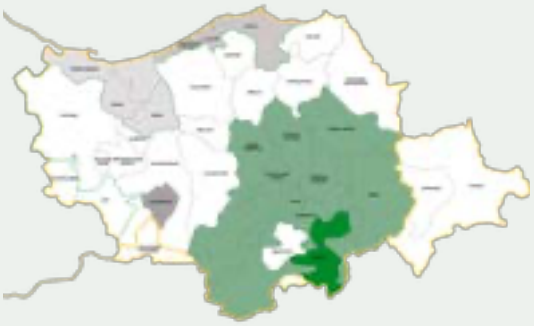
1. (in verde scuro) Ambito territoriale SNAI Alte Madonie;
2. (in verde) Ambito territoriale SNAI Basse Madonie;
3. (in verde chiaro) Ambito territoriale SNAI Madonie Imeresi.

4. (in grigio chiaro) Area gravitazionale strategica per l'Ambito SNAI Madonie Imeresi
5. (in grigio) Area di gravitazione strategica per l'Ambito SNAI Basse Madonie
6. (in grigio scuro) Area di gravitazione strategica per l'Ambito SNAI Alte Madonie

Alimena

II.1.4.1 Alte Madonie

Città metropolitana Palermo (PA)
Regione Sicilia
Popolazione 1.766 abitanti (01/01/2023 - Istat)
Superficie 59,70 km²
Densità 29,58 ab./km²



Classificazione sismica e climatica

Zona sismica 2
Zoma climatica D
Gradi giorno 1.1816

Dati geografici

Altitudine 740 m s.l.m. - minima: 342 - massima: 1.003
Coordinate Geografiche *sistema sessagesimale* 37° 41' 40,92" N - 14° 6' 52,20" E
sistema decimale 37,6947° N - 14,1145° E

Storia

Posizionato a un'altitudine di 750 metri, Alimena si trova sulle pendici delle Madonie, immersa in vaste estensioni di terreni coltivati a grano, tra il Salso Settentrionale e l'Imera Meridionale. Il centro di Alimena occupa la regione sud-orientale delle Madonie, in prossimità della Balza di Areddula, sullo spartiacque tra i sopracitati fiumi. Le sue origini risalgono al XVII secolo, periodo in cui un'attività agricola intensiva caratterizzò la zona. Le prime abitazioni furono erette per volere di Pietro Alimena, ma il centro si sviluppò ulteriormente solo nel 1628, quando il suo successore Antonio Alimena (titolato Marchese) ottenne dalla corona spagnola (Filippo IV) la "licenza populandi" con tutte le "giurisdizioni e le altre cose concesse nel privilegio e negli atti". Questa concessione comprendeva le zone di Portella Nuciforo, San Filippo, il fondo della Mazza e l'antica Imaccara (Garrosia e Bulfara). L'impianto urbanistico di Alimena si presenta secondo uno schema pressoché regolare, con una trama viaria ortogonale e allineamenti lungo un asse principale che culmina nel fuoco centrale adiacente alla fiancata est della Chiesa Madre. Sebbene vi siano tagli viari irregolari nelle aree di margine, il tessuto edilizio si adatta alle pendenze del sito di giacitura. Il centro conserva ancora oggi le sue funzioni residenziali e commerciali, mostrando segni di riuso edilizio con limitate sostituzioni; lo stato di conservazione è ritenuto discreto. Tra i monumenti più significativi figurano la Chiesa Madre, che ospita una statua dell'Immacolata di Francesco Sorgi; la Chiesa dell'ex Convento dei PP. Riformati, che custodisce un Cristo spirante di autore ignoto risalente al XVII-XVIII secolo, e la Chiesa delle Anime Sante. Dal punto di vista economico, il comune presenta un settore agricolo e zootecnico di modesta entità, caratterizzato da piccole aziende del settore e da un marcato fenomeno di emigrazione. Nelle campagne di Alimena si coltivano principalmente granaglie, mandorle, fave e olive, oltre alla produzione di vino. In passato, la zona era estremamente fertile grazie al clima favorevole e alla posizione tra quattro fiumi: Pellizzara, il Salso di Gangi, il Segnaferi e l'Imera Meridionale, nonché alla presenza di miniere di sale e zolfo. Tra le contrade di Alimena, quella di "Bolfara" può vantare origini particolarmente antiche. Nella contrada "Burgarito", situata in aperta campagna, si erge una piccola abside costruita su una roccia a strapiombo su un torrente. Nei pressi del santuario, sono presenti alcune grotte rupestri di notevole interesse e una chiesa dedicata a S. Alfonso De' Liguori, di forma esagonale, che originariamente fungeva da torre di sorveglianza su un vasto territorio, comprendente oltre alle pendici meridionali delle Madonie, anche i monti Erei. Altre contrade degne di nota includono: Destri, Chiappara, Garrasia, Vaccarizzo e Celsi.
da Comune di Alimena. (2024). Comune di Alimena. https://www.comune.alimena.pa.it/sito/

Blufi

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	875 abitanti (01/01/2023 - Istat)
Superficie	21,98 km²
Densità	39,81 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.734

Dati geografici

Altitudine	725 m s.l.m. - minima: 430 - massima: 871
Coordinate Geografiche	*sistema sessagesimale* 37° 45’ 11,16’’ N - 14° 4’ 25,68’’ E *sistema decimale* 37,7531° N - 14,0738° E

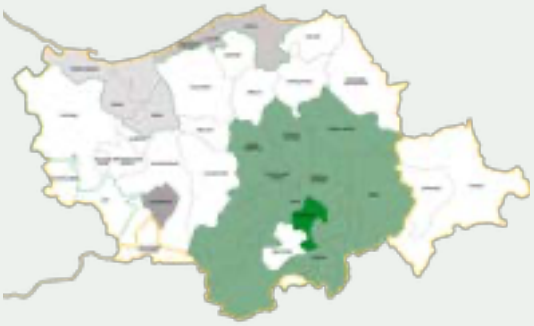
Storia

Il centro abitato si estende su un rilievo del versante meridionale delle Madonie, a un’altitudine di 720 metri sul livello del mare. La superficie comunale, con una estensione di 2.056 ettari attorno al centro principale, include l’isola amministrativa di Casalgiordano, collocata tra i comuni di Gangi e Alimena. Le altre frazioni, quali Alleri, Lupi e Ferrarello, sono separate dal torrente Nocilla, mentre Calabrò, Nero e Giaia inferiore costituiscono una sorta di continuazione lungo la strada che conduce alle Petralie.Il territorio è attraversato dai corsi d’acqua del fiume Imera Meridionale e dai torrenti Nocilla e Oliva, prevalentemente destinato a attività agricole e artigianali. Le notizie sulla storia di Blufi e sul suo toponimo sono scarse e confuse. Il termine “Blufi” appare per la prima volta nel 1211 in un documento in cui la chiesa palermitana concede a Federico II, tra le altre concessioni, i possedimenti chiamati “Buluf” presso Petralia. Nel corso del tempo, si incontrano varianti come Belufi, Balufi, Bolufi, fino a giungere al nome attuale Blufi in un documento relativo al Santuario della Madonna dell’Olio. Esiste un’ipotesi secondo cui il nome potrebbe derivare dalle parole greche “boos” (bue) e “lofos” (colle), richiamando un leggendario colle del bue. Tuttavia, la teoria più accreditata sostiene che il nome Blufi derivi da una cucurbitacea, un’erba utilizzata a scopo medicinale dagli abitanti locali, presente nella zona che in arabo viene chiamata Buluf. Certo è che le vicende storiche di Blufi sono strettamente legate a quelle di Petralia Soprana, della quale Blufi è stata una frazione fino al 1972. Ferrarello rappresenta la borgata più estesa del comune. Si ritiene che il toponimo derivi dal cognome di uno dei suoi primi abitanti, dato che il cognome Ferrarello è diffuso nella zona. Il borgo è suddiviso nei quartieri “Cuozzu”, “Signuruzzu”, “Collesano” e “Gatto”, quest’ultimo appartenente al comune di Bompietro. Durante l’estate, in particolare ogni ultima domenica di luglio, il piccolo borgo si popola di emigrati che ritornano nel luogo di nascita. A Ferrarello, si celebra ogni ultima domenica di luglio la festa di San Giuseppe e del Sacro Cuore di Gesù, articolata su due giorni con degustazione di prodotti tipici locali e celebrazioni religiose seguite da una processione con i simulacri portati per le vie del paese dalla venerabile confraternita di San Giuseppe di Ferrarello. Da due anni, la borgata di Ferrarello gode nuovamente della sua chiesa parrocchiale, una costruzione moderna che conferisce vitalità al borgo. La borgata di Nero, situata a meno di un chilometro da Blufi e risalente alla fine del XIX secolo, potrebbe derivare dall’appellativo “Niguru” dato a uno dei suoi primi abitanti, presumibilmente per il colore della carnagione.
da Comune di Blufi. (2024). Comune di Blufi. https://www.comune.blufi.pa.it/it

Bompietro

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	1.201 abitanti (01/01/2023 - Istat)
Superficie	42,41 km²
Densità	28,32 ab./km²



Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.715

Dati geografici

Altitudine	685 m s.l.m. - minima: 368 - massima: 1.007
Coordinate Geografiche	*sistema sessagesimale* 37° 44’ 45,60” N - 14° 5’ 37,68” E *sistema decimale* 37,7460° N - 14,0938° E

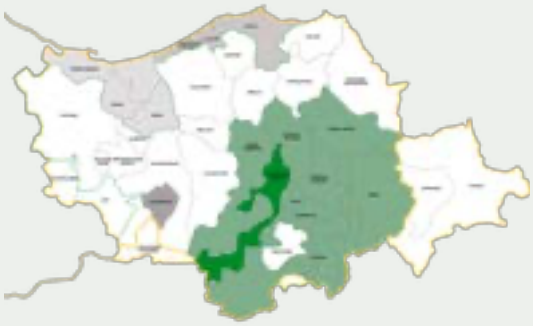
Storia

Il nucleo urbano di Bompietro, situato nelle Madonie sud-orientali, si trova a un’altitudine di 685 metri sul livello del mare. Questa località si distingue per il suo fascino particolare, che deriva non solo dalla sua posizione geografica, ma anche dalla forte vocazione agrituristica che caratterizza il territorio. Bompietro offre ai visitatori un’esperienza autentica, permettendo di immergersi nella vita rurale tradizionale. Passeggiando per le strade del paese, si ha l’opportunità di osservare da vicino le antiche abitazioni, le cui pareti annerite dal fumo testimoniano la pratica ancora viva di riscaldare il latte per la produzione artigianale di formaggi. Il rito della mungitura serale, unito al profumo inebriante dei canestri di vimini traboccanti di ricotta calda e fumante, crea un’atmosfera suggestiva che avvolge chiunque visiti questo luogo. Il clima di Bompietro è mite anche durante i mesi invernali, rendendo il paese una destinazione piacevole tutto l’anno. Tuttavia, l’estate porta con sé la necessità per i pastori di percorrere lunghe distanze alla ricerca di pascoli adeguati per nutrire il bestiame, un elemento che aggiunge un ulteriore strato di autenticità alla vita rurale del luogo. È proprio questa combinazione di tradizioni secolari e bellezze naturali che conferisce a Bompietro un’aura magica, capace di affascinare i visitatori di ogni epoca. Le origini storiche di Bompietro risalgono al XVII secolo, quando alcuni signorotti delle vicine Petralie scoprirono questo angolo incontaminato e decisero di stabilirvi le loro residenze. Da allora, il paese ha iniziato a svilupparsi con la costruzione delle prime ville e case coloniche, dando vita al villaggio che oggi conosciamo. Il nome Bompietro si ispira alla figura leggendaria di un “buon Pietro,” noto per la sua generosità e per la sua capacità di curare le persone utilizzando le erbe medicinali presenti nella zona, contribuendo così al benessere della comunità. Una visita a Bompietro può iniziare dal suo affascinante centro storico, con tappe obbligate al Palazzo Ganci, alla Chiesa Madre e alle chiese dei Santi Pietro e Paolo, del Calvario e della Sacra Famiglia. Il paese offre anche strutture sportive comunali, dove durante i fine settimana è possibile praticare attività come tennis, calcetto o bocce, aggiungendo un tocco di dinamismo alla quiete rurale. L’agricoltura è la principale fonte di reddito per gli abitanti di Bompietro. Le coltivazioni predominanti sono cerealicole e foraggere, mentre nelle aree più basse del territorio si trovano estese piantagioni di ulivi, mandorli e viti. Queste attività agricole non solo sostengono l’economia locale, ma contribuiscono anche a preservare il paesaggio rurale e le tradizioni che definiscono l’identità del territorio.
da Comune di Alimena. (2024). Comune di Alimena. https://www.comune.alimena.pa.it/sito/

Castellana Sicula

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	3.014 abitanti (01/01/2023 - Istat)
Superficie	73,20 km²
Densità	41,18 ab./km²



Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.835

Dati geografici

Altitudine	765 m s.l.m. - minima: 341 - massima: 1.900
Coordinate Geografiche	*sistema sessagesimale* 37° 47’ 9,24’’ N - 14° 2’ 24,72’’ E *sistema decimale* 37,7859° N - 14,0402° E

Storia

Il comune di Castellana Sicula fu istituito nel 1947, a seguito dello scorporo dal territorio di Petralia Sottana, e oggi fa parte integrante del Parco delle Madonie. Le prime tracce degli insediamenti urbani risalgono alla prima metà del XVII secolo, quando contadini e agricoltori provenienti dai paesi circostanti, tra cui la prospera Petralia, identificarono nella fertile pianura dove sarebbe sorta Castellana un luogo ideale per la coltivazione. Sebbene la data esatta della fondazione del borgo non sia certa, si stima che questa sia avvenuta tra il XVII e il XVIII secolo, probabilmente tra il 1650 e il 1713, anno in cui gli spagnoli cedettero i domini siciliani agli Asburgo d’Austria con la pace di Utrecht. Durante questo periodo, il duca di Ferrandina, feudatario dei feudi di Castellana, Fana e Maimone, ottenne da re Filippo V di Spagna il *ius populandi*, ovvero il diritto di fondare nuovi borghi. Si ritiene che, a seguito del matrimonio del duca con Gemma, una nobile della famiglia spagnola dei Castellana (o Castelletti, Castellitti o Incastilletta, originaria della Catalogna), il borgo sia stato denominato Castellana in omaggio alla consorte. La cultura e le tradizioni locali di Castellana Sicula sono ancora oggi vive e partecipate. Ad esempio, nel mese di agosto, il gruppo folkloristico locale esegue il ballo della cordella, un’antica danza di fertilità che coinvolge 24 danzatori. Questi, ciascuno con un’estremità di un nastro legato alla cima di un palo alto 3 metri, intrecciano e scompigliano i nastri seguendo una coreografia tradizionale. Un altro evento significativo è il Carnevale delle Madonie, che si svolge la domenica precedente il martedì grasso, e anima la comunità di Castellana Sicula con festeggiamenti e sfilate di maschere. Queste tradizioni contribuiscono a mantenere vivo il legame con il passato, preservando e celebrando l’identità culturale del territorio.
da Comune di Castellana Sicula. (2024). Comune di Castellana Sicula. https://www.comune.castellana-sicula.pa.it/

Gangi

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	6.107 abitanti (01/01/2023 - Istat)
Superficie	127,46 km²
Densità	47,91 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	2.179

Dati geografici

Altitudine	1.011 m s.l.m. - minima: 408 - massima: 1.333
Coordinate Geografiche	*sistema sessagesimale* 37° 47’ 48,12” N - 14° 12’ 18,72” E *sistema decimale* 37,7967° N - 14,2052° E

Storia

Noto anche come Ganci in siciliano, è un comune italiano con una popolazione di 6.183 abitanti, situato nella città metropolitana di Palermo, in Sicilia. I ritrovamenti più antichi nel territorio di Gangi risalgono all’età del bronzo antico, durante l’epoca caratterizzata dalla cultura di Castelluccio. Necropoli con tombe a grotticella sono state rinvenute nei siti di Serra del Vento e nelle contrade Regiovanni e Zappaiello, a circa dieci chilometri dall’attuale centro abitato. Gangi è stata a lungo associata alla leggendaria città cretese di Engyon, posizionata nelle vicinanze di Gangivecchio o Monte Alburchia. Le prime evidenze archeologiche sembrano confermare questa identificazione. La storia di Gangi risale al XII secolo, quando era ubicata nel sito originario di contrada Gangivecchio. Nel 1299, durante la guerra dei Vespri, Federico III distrusse il paese, ma fu successivamente ricostruito sul monte Marone. I primi documenti storiografici attestano l’esistenza di Gangi nel XII secolo, quando fu inclusa nei possedimenti della contea di Geraci. Nel 1195, Enrico VI di Svevia assegnò alla famiglia de Craon, rappresentata dalla contessa Guerrera, i territori della contea, includendo il territorio di Gangi. Dal XIII secolo, la contea di Geraci passò sotto la dominazione dei nobili Ventimiglia. Nel XVI secolo, Gangi, insieme al resto della Sicilia, divenne parte dell’Impero spagnolo e fu soggetta all’Inquisizione. Nel 1625, un membro della famiglia Graffeo Maniaci acquistò il territorio di Gangi dai Ventimiglia, ottenendo il titolo di Principe di Gangi nel 1629 da Filippo IV di Spagna. Il titolo rimase alla famiglia Graffeo fino al 1652, quando passò al principe di Valguarnera tramite dote matrimoniale, e la sua casata mantenne il titolo fino al XIX secolo. Nel Settecento, furono fondate accademie a Gangi, con la più nota chiamata degli Industriosi, affiliata al mondo massonico. La Chiesa della Badia fu costruita nel corso del secolo, annessa al monastero delle benedettine. Gangi fu coinvolta nel periodo dell’Inquisizione spagnola, e il paese fu teatro di un noto episodio durante l’assedio di Gangi del 1º gennaio 1926, guidato dal prefetto Cesare Mori, che rastrellò il paese alla ricerca di banditi, mafiosi e latitanti. Nel corso del Settecento, Gangi fu anche sede dell’Accademia degli Industriosi, un centro di reclutamento massonico, con un’attiva propaganda filogiansenistica. Questo periodo vide una convergenza tra i mondi massonico e giansenista in una prospettiva anticurialista. Lo stemma di Gangi raffigura un Minotauro che si ristora presso una fonte, con un riferimento alla leggenda secondo cui la città di Engyon, da cui Gangi sarebbe sorta, fu fondata da soldati cretesi su un monte da cui sgorgava l’antico fiume Engio. Il gonfalone è un drappo partito di bianco e azzurro.
da Comune di Gangi. (2024). Comune di Gangi. https://www.comune.gangi.pa.it/

Geraci Siculo

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	1.707 abitanti(01/01/2023 - Istat)
Superficie	113,35 km²
Densità	15,06 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	E
Gradi giorno	2.282

Dati geografici

Altitudine	1.077 m s.l.m. - minima: 180 - massima: 1.660
Coordinate Geografiche	*sistema sessagesimale* 37° 51’ 38,88” N - 14° 9’ 15,84” E *sistema decimale* 37,8608° N - 14,1544° E

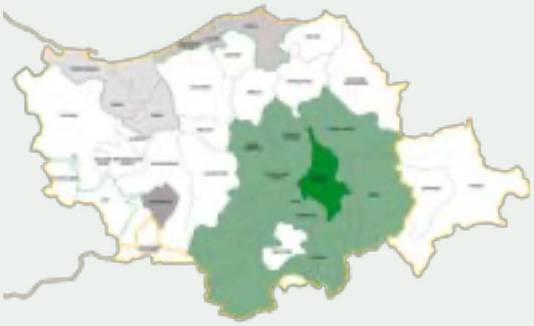
Storia

Conosciuto come Jiraci in siciliano, è un comune italiano con una popolazione di 1.702 abitanti, situato nella città metropolitana di Palermo, in Sicilia. Nel 1338, il territorio di Geraci Siculo fu teatro di una cruenta battaglia tra Pietro II di Sicilia e Francesco I Ventimiglia. Il comune è parte del Parco delle Madonie e gode del riconoscimento del club “I borghi più belli d’Italia”. Inoltre, possiede il marchio di qualità “Comune fiorito”.
Geraci Siculo è un antico paese con un impianto urbanistico risalente al Medioevo. L’agricoltura e la pastorizia costituiscono le principali attività economiche, con uno stabilimento dedicato alla raccolta e all’imbottigliamento dell’acqua minerale proveniente dalle fonti delle montagne geracesi. Il paese è noto per le sue tradizioni, tra cui la festa del ringraziamento dedicata ai Santi Bartolo e Giacomo, e la festa del Crocifisso. Tra gli eventi significativi vi è il torneo cavalleresco in costume d’epoca denominato “Giostra dei Ventimiglia”. Il territorio di Geraci Siculo ha una storia che risale all’epoca preistorica, come evidenziato dai reperti esposti nel Museo Minà Palumbo di Castelbuono e nel Museo Archeologico di Palermo. La colonizzazione greca dopo il 550 a.C., assegnarono all’insediamento il nome di Jerax, Ιέραξ in greco avvoltoio, per la presenza di avvoltoi nella Rocca. Nel 241 a.C., Geraci era un importante insediamento romano, entrando così nella sfera culturale del mondo greco-romano e poi bizantino. Durante l’alto medioevo, la zona di Geraci continuò a essere abitata. Le notizie certe su Geraci risalgono all’840 d.C., durante la conquista saracena. Il Castello, già prima della dominazione saracena, fu ampliato e fortificato. Dopo la suddivisione della Sicilia in tre province musulmane, le Madonie, e quindi Geraci, facevano parte della prima provincia, mantenendo la propria fede e convivendo pacificamente con l’elemento islamico. Con la conquista normanna, il borgo di Geraci fu concesso in feudo a Riccardo Serlo II d’Altavilla da Ruggero I, dopo la battaglia di Cerami. Nel corso del tempo, la contea passò sotto la famiglia Ventimiglia. Nel 1258, Enrico II Ventimiglia divenne Conte di Geraci sposando la contessa Isabella. I Ventimiglia governarono la contea fino all’abolizione della feudalità. Durante il regno di Corrado II, la contea si espande includendo Collesano, Petralia Superiore e Inferiore, Gratteri e Isnello. La contea divenne gradualmente uno “stato nello stato”, amministrando la giustizia e coniando monete proprie. Nel 1813, il Principe Giuseppe Ventimiglia di Belmonte fu arrestato per aver difeso la costituzione e la libertà del Regno di Sicilia. Negli anni successivi, Geraci visse una vita politica e amministrativa simile a quella di altri paesi dell’entroterra siciliano. I Ventimiglia, l’ultimo ramo rimasto, continuano ad interessarsi delle sorti della Contea fino ai giorni nostri.
da Comune di Geraci Siculo. (2024). Comune di Geraci Siculo. https://www.comune.geracisiculo.pa.it/it

Petralia Soprana

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	2.973 abitanti(01/01/2023 - Istat)
Superficie	56,10 km²
Densità	52,99 ab./km²



Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	E
Gradi giorno	2.382

Dati geografici

Altitudine	1.147 m s.l.m. - minima: 532 - massima: 1.657
Coordinate Geografiche	*sistema sessagesimale* 37° 48’ 5,76’’ N - 14° 6’ 30,24’’ E *sistema decimale* 37,8016° N - 14,1084° E

Storia

Petralia Soprana, conosciuta anche come “A Suprana” in dialetto siciliano, è un comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 2.975 abitanti. Questo pittoresco borgo, parte integrante del Parco delle Madonie, si distingue per essere il comune più elevato all’interno della catena montuosa delle Madonie e uno dei più alti dell’intera Sicilia. Inserita nel circuito dei “Borghi più Belli d’Italia”, Petralia Soprana ha ricevuto il prestigioso titolo di “Borgo dei borghi 2018”, un riconoscimento che ne sottolinea il fascino e il valore storico-culturale. Il territorio di Petralia Soprana, situato sul versante meridionale delle Madonie, è caratterizzato dalla presenza del fiume Salso e da una varietà di paesaggi naturali, che vanno dai boschi e dalla macchia mediterranea ai pascoli, terreni seminativi e coltivazioni arboree. L’altitudine del comune varia da 600 metri fino a 1.657 metri, presso il Pizzo Corvo, contribuendo alla sua posizione privilegiata e al suo clima variegato. Secondo Diodoro Siculo, Petralia Soprana è identificata con Petra, un’antica città sicana. Durante la prima guerra punica, nel 254 a.C., la cittadina passò sotto il dominio romano dopo la conquista di Palermo, diventando uno dei principali fornitori di grano per Roma. Nel IX secolo, durante il regno degli Aghlabidi, la città fu rinominata Batraliah, riflettendo l’influenza araba sulla regione. La conquista normanna del 1062 segnò un nuovo capitolo nella storia di Petralia Soprana, con la fortificazione della città attraverso l’edificazione di castelli, torri e chiese. Nel 1258, le due distinte Petralie, Inferiore e Superiore, entrarono a far parte del patrimonio dei conti Ventimiglia di Geraci Siculo, e successivamente passarono sotto diverse dominazioni fino all’abolizione della feudalità nel 1817. Lo stemma comunale di Petralia Soprana, concesso nel 1993, simboleggia le due anime del comune: un cardo delle Madonie, rappresentativo della flora locale, e una torre d’argento murata di nero, emblema della sua storia fortificata e della sua identità radicata nel passato.
da Comune di Petralia Soprana. (2024). Comune di Petralia Soprana. https://comune.petraliasoprana.pa.it/

Petralia Sottana

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	2.477 abitanti(01/01/2023 - Istat)
Superficie	178,34 km²
Densità	13,89 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	E
Gradi giorno	2.162

Dati geografici

Altitudine	1.000 m s.l.m. - minima: 340 - massima: 1.977
Coordinate Geografiche	*sistema sessagesimale* 37° 48’ 37,80’’ N - 14° 5’ 35,88’’ E *sistema decimale* 37,8105° N - 14,0933° E

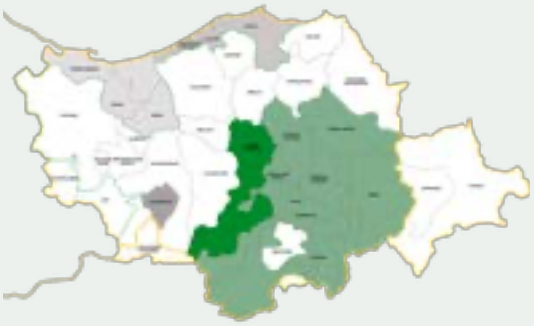
Storia

Conosciuta come Pitralìa Suttana in siciliano, è un comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 2.472 abitanti.
Inserita nel parco delle Madonie e appartenente al circuito Bandiera arancione, la cittadina è posizionata sul versante meridionale della catena delle Madonie, nell’alta valle del fiume Imera Meridionale, sviluppandosi su un pendio tra i 900 e i 1100 metri sul livello del mare. Il territorio comunale, esteso per 178 km², prevalentemente in zona montana, si estende in latitudine dallo spartiacque della catena delle Madonie a nord fino a raggiungere la provincia di Caltanissetta a sud.
Nella parte settentrionale, inclusa nel Parco delle Madonie, si trovano estese formazioni boschive di latifoglie e conifere, nonché ampie zone destinate al pascolo. Nella parte meridionale, prevale la coltivazione estensiva. Classificato nella Regione agraria 3 (“Montagna interna - Madonie Orientali”), il comune è considerato una zona sismica di tipo “2” (sismicità medio-alta). Il clima, tipicamente mediterraneo-montano, presenta inverni rigidi e piovosi con abbondanti nevicate e estati calde e secche.
Le prime tracce di insediamento umano risalgono al IV/III millennio a.C. Nel III secolo a.C., con la conquista romana, Petra divenne una città “decumana” e un centro di rilievo come presidio militare e mercato agricolo. Con la conquista araba nel IX secolo, la città venne ribattezzata “Batarliah” o “Batraliah”, diventando una piazzaforte militare strategica e un mercato con diverse comunità etnico-religiose.
I Normanni conquistarono Petralia intorno al 1062, fondando un castello. Nel corso dei secoli successivi, il centro seguì le sorti dell’isola, subendo invasioni barbariche, riconquiste bizantine e cambi di dominazione. Lo stemma civico è il Giglio di roccia, una pianta di giglio d’oro su sfondo rosso, collegato alla probabile origine della denominazione del paese (Lilium Petrae).
Lo stemma è sormontato dalla corona di città e presenta un cartiglio con il motto “Lilium Petrae”. Concesso con decreto del presidente della Repubblica Italiana del 27 luglio 1993.
da Comune di Petralia Sottana. (2024). Comune di Petralia Sottana. https://www.comune.petraliasottana.pa.it/

Polizzi Generosa

II.1.4.1 Alte Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	2.913 abitanti (01/01/2023 - Istat)
Superficie	134,66 km²
Densità	21,63 ab./km²



Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	2.037

Dati geografici

Altitudine	920 m s.l.m. - minima: 362 - massima: 1.869
Coordinate Geografiche	*sistema sessagesimale* 37° 48’ 46,44” N - 14° 0’ 15,12” E *sistema decimale* 37,8129° N - 14,0042° E

Storia

Conosciuta in siciliano come Pulizzi, Polizzi Generosa è un comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 2.979 abitanti.
Inserita all’interno del Parco delle Madonie, la cittadina vanta una storia antica, risalente al VI secolo a.C., come dimostrano i numerosi rinvenimenti archeologici, tra cui una moneta anepigrafa imerese. Nel corso degli anni sono stati scoperti e studiati reperti punici e una necropoli risalente alle epoche classica ed ellenistica, che hanno arricchito la comprensione della storia di Polizzi Generosa.
Nel IV secolo a.C., Polizzi Generosa acquisì importanza grazie alla sua posizione strategica lungo il confine tra i domini punici e quelli siracusani. In questo periodo, il centro ospitava un presidio stabile e una fortezza presidiata da milizie mercenarie di origine campana. Testimonianze romane presenti nel territorio confermano l’importanza storica di Polizzi Generosa. Il toponimo “Polizzi” ha origine greca o bizantina e deriva da un toponimo composto che termina in “Polis” (città). L’evoluzione del nome da Polis a Polizzi è ben documentata nelle varie grafie presenti nei documenti dell’epoca normanna. Contrariamente a quanto sostenuto da alcune teorie, il nome “Polizzi” non deriva da due omonime famiglie nobili, poiché il toponimo precede l’adozione di tali cognomi.
Polizzi Generosa fu un prospero centro sotto la dominazione araba per quasi due secoli e mantenne la sua floridezza durante il periodo angioino, diventando successivamente una città demaniale. Tuttavia, la cittadina iniziò a declinare a causa della devastante pestilenza del 1575-76, che decimò la popolazione.
Nonostante ciò, nel XIX secolo si verificò una ripresa delle attività commerciali. L’appellativo “Generosa” venne concesso da Federico II, impressionato dall’ospitalità ricevuta durante la sua visita. Questa denominazione fu ufficializzata nel 1863 con Regio Decreto n. 1218, sancendo così il nome completo di Polizzi Generosa.
da Comune di Polizzi Generosa. (2024). Comune di Polizzi Generosa. https://www.comune.polizzi.pa.it/

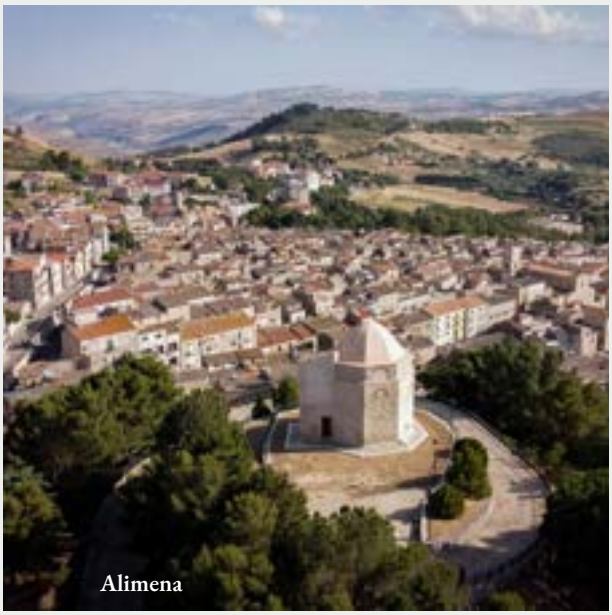
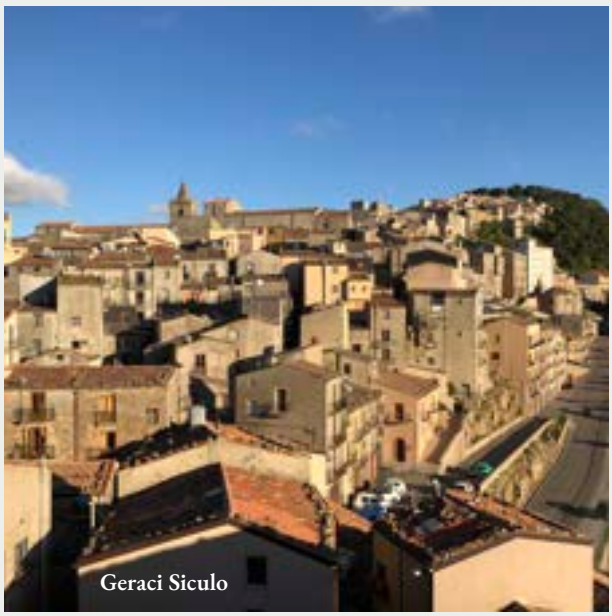


Fig. II.1.4.1.2 | Alte Madonie. ©Luisa Lombardo, 2021

Blufi

Castellana Sicula


Geraci Siculo

Il comprensorio delle Alte Madonie è un'area che comprende i comuni collocati a maggiore altitudine e si estende su una superficie complessiva di 1.176,52 chilometri quadrati. Quest'area è caratterizzata da una popolazione complessiva di circa 30.000 abitanti, con una densità media piuttosto bassa, circa 31 abitanti per chilometro quadrato, a testimonianza della natura prevalentemente rurale e montuosa del territorio. Attualmente, questa parte del comprensorio è costituito da 11 comuni, alcuni dei quali sono stati aggiunti più recentemente, nel 2024, come Alia e Valledolmo, che fanno parte della Provincia di Palermo:

- **Alia:** 3.909 abitanti;
- **Alimena:** 2.138 abitanti;
- **Blufi:** 1.058 abitanti;
- **Bompietro:** 1.460 abitanti;
- **Castellana Sicula:** 3.489 abitanti;
- **Gangi:** 6.993 abitanti;
- **Geraci Siculo:** 1.907 abitanti;
- **Petralia Soprana:** 3.416 abitanti;
- **Petralia Sottana:** 2.938 abitanti;
- **Polizzi Generosa:** 3.543 abitanti;
- **Valledolmo:** 3.716 abitanti.

Questo territorio, per la sua particolare conformazione geografica e la distribuzione dei principali assi viari, non trova spesso naturali sbocchi verso i comuni limitrofi situati lungo la fascia costiera, soprattutto grazie alla vicinanza con l'autostrada A/20, che collega i comuni di Cefalù e Pollina con le città di Palermo e Messina, asse viario che rappresenta un'importante arteria di comunicazione per il trasporto di persone e merci, favorendo l'accesso ai mercati più grandi e alle principali vie di comunicazione dell'isola.

L'area delle Alte Madonie è tra le ultraperiferiche della strategia SNAI per la sua distanza dai servizi essenziali. Proprio per la sua "inaccessibilità" il comprensorio e, nello specifico l'area, ha mantenuto i caratteri identitari di un tempo; è quella più autentica, ma anche quella più difficile da raggiungere. Nel dettaglio, i comuni sono anche in linea d'area molto vicini, tuttavia, raggiungerli tramite i collegamenti presenti implica almeno un'ora e mezza di macchina.

Fig. II.1.4.1.2 | Alte Madonie. ©Luisa Lombardo, 2021

Castelbuono

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	8.123 abitanti (01/01/2023 - Istat)
Superficie	60,79 km²
Densità	133,63 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	C
Gradi giorno	1.321

Dati geografici

Altitudine	423 m s.l.m. - minima: 70 - massima: 1.633
Coordinate Geografiche	*sistema sessagesimale* 37° 55’ 58,80’’ N - 14° 5’ 21,84’’ E *sistema decimale* 37,9330° N - 14,0894° E

Storia

Conosciuto anche come Castiḍḍubbonu in siciliano, l’insediamento si trova a un’altitudine di circa 423 metri sul livello del mare, sulle pendici del colle Milocca. In epoca antica, le prime tracce di insediamento risalgono al periodo neolitico (III millennio a.C.), con utensili domestici e armi di pietra levigata attribuibili probabilmente alle popolazioni di stirpe sicana. Durante il periodo di colonizzazione greca, si distingue la figura poetica del pastore Dafni, nato sulle Madonie. Inoltre, reperti archeologici della civiltà greco-romana sono stati rinvenuti nella necropoli di Bergi. Nell’età medioevale, si attesta l’esistenza di un casale d’Ypsigro durante il periodo bizantino, interpretato come una zona fresca in media altitudine. Le origini di Castelbuono risalgono agli inizi del Trecento, quando i Ventimiglia, signori della Contea di Geraci, decisero di costruire un castello sul poggio dominante l’antico casale d’Ypsigro. Durante l’età islamica e normanna, si riscontrano ruderi di fabbricati a San Guglielmo, tracce di necropoli, la tradizione di una vecchia moschea e altri elementi che risalgono a questo periodo. La zona di Castelbuono sembra coincidere con la località di Riqqat Basili, menzionata da al-Idrisi nel XII secolo. Il primo documento che attesta il nome di Castelbuono risale al 1329, un atto notarile in cui il conte Francesco Ventimiglia dichiara di detenere il bosco e le terre di S. Maria di Bisanzio in territorio Castri Boni. La fondazione ufficiale del castello, e quindi del paese, è testimoniata da una lapide sull’arco di ingresso del maniero datata al 1317. Nel corso dei secoli, la famiglia Ventimiglia ha dominato la contea di Ypsigro, estendendo il suo controllo fino al XX secolo. Nel XV secolo, Giovanni I Ventimiglia, marchese di Geraci, trasferisce la sua “corte” a Castelbuono, contribuendo alla rinascita culturale ed economica del luogo. Nel 1595, Giovanni III Ventimiglia ottiene il titolo di principe di Castelbuono, e il paese diventa la “capitale dello Stato di Geraci”. Nel 1812, con l’abolizione dei privilegi feudali, inizia un nuovo periodo per Castelbuono, che vede la presenza di nuove casate nobiliari come i Guerrieri, i Collotti e i Galbo. Nel XIX secolo, la città partecipa alle rivolte contro i Borboni nel 1848 e nel 1860, ricevendo elogi da Giuseppe Garibaldi. Durante il periodo contemporaneo, Castelbuono vive gli eventi delle due guerre mondiali e, nel 1943, il capitano Kelly insedia il primo consiglio comunale dopo la liberazione dal fascismo. Castelbuono è un centro ricco di storia e cultura, con una comunità che ha contribuito significativamente allo sviluppo economico e culturale della regione. Nel 1946, la città vive la transizione verso la Repubblica, eleggendo il suo primo sindaco post-bellico, Filippo Bonomo. Lo stemma e il gonfalone del comune sono stati concessi nel 2010, con lo stemma raffigurante un castello dorato su sfondo azzurro, murato di nero e munito di tre torri.
da Comune di Castelbuono. (2024). Comune di Castelbuono. https://www.comune.castelbuono.pa.it/

Collesano

II.1.4.2 Basse Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	3.656 abitanti (01/01/2023 - Istat)
Superficie	108,16 km²
Densità	33,80 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	C
Gradi giorno	1.379

Dati geografici

Altitudine	468 m s.l.m. - minima: 18 - massima: 1.656
Coordinate Geografiche	*sistema sessagesimale* 37° 55’ 9,84” N - 13° 56’ 11,40” E *sistema decimale* 37,9194° N - 13,9365° E

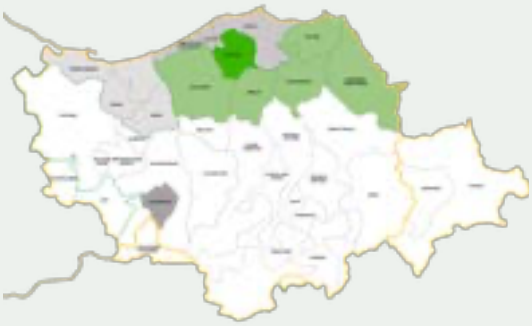
Storia

Noto anche come Ulisanu in siciliano, è un comune italiano con una popolazione di 3.656 abitanti, situato nella città metropolitana di Palermo in Sicilia. La località è sede del Museo dedicato alla celebre competizione automobilistica Targa Florio, di cui costituisce uno dei principali luoghi di passaggio.
Inoltre, Collesano fa parte del suggestivo Parco delle Madonie. L’insediamento di Collesano si sviluppa lungo il pendio di un’ampia vallata situata ai piedi del rilievo carbonatico “Poggio Grotta del Signore” (897 m s.l.m.), delimitata dai torrenti Mora a nord e Zubbio ad ovest, che confluiscono a valle nel torrente Roccella.
Il territorio comunale, parte del quale è compreso nel Parco delle Madonie, si trova sul versante nord-occidentale del gruppo montuoso delle Madonie occidentali. I rilievi circostanti, quali Monte Castellaro (1.656 m), monte Cucullo (1.311 m), Pizzo Giammarusa (1.064 m) e Monte d’Oro (808 m), caratterizzano il paesaggio della zona con le loro distintive peculiarità morfologiche e vegetazionali.
Dal punto di vista storico, secondo Michele Amari, un primo insediamento urbano potrebbe corrispondere al sito citato dal geografo arabo
Al Muqaddasi nel X secolo con il nome di Qal’at as-sirat (“rocca sulla retta via”). Nella zona sono stati rinvenuti reperti di epoca protostorica, come ceramiche datate al VII secolo a.C. Dopo la conquista normanna, sotto il nome di Golisano, sorse l’attuale Collesano che divenne centro di un vasto feudo esteso tra il torrente Roccella e l’interno delle Madonie, inizialmente concesso a Rainolfo, nipote del gran conte Ruggero. Su impulso di Ruggero II, re di Sicilia, il centro fortificato venne distrutto e ricostruito nel sito attuale, assegnato in feudo ad Adelicia di Adernò, nipote del re (1140).
Collesano è citato nel Libro di Ruggero del geografo arabo Idrisi come un centro fortificato distrutto da Ruggero II e poi ricostruito nel sito attuale. Dal XIII secolo, appartenne alla famiglia Siracusa e successivamente ai Ventimiglia, che governarono sulla contea delle Madonie.
Col tempo, la località passò in possesso delle famiglie Centelles, Cardona, Aragona, Moncada e infine Ferrandina di Toledo, ultimi feudatari prima dell’abolizione della feudalità in Sicilia nel 1812.
da Comune di Collesano. (2024). Comune di Collesano. https://www.comune.collesano.pa.it/

Gratteri

II.1.4.2 Basse Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	859 abitanti (01/01/2023 - Istat)
Superficie	38,17 km²
Densità	22,51 ab./km²



Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.734

Dati geografici

Altitudine	657 m s.l.m. - minima: 70 - massima: 1.379
Coordinate Geografiche	*sistema sessagesimale* 37° 57’ 59,76” N - 13° 58’ 23,16” E *sistema decimale* 37,9666° N - 13,9731° E

Storia

Ratteri in siciliano, è un piccolo centro delle Madonie che domina panoramicamente la costa tirrenica dalla regione geografica montana posta a sud-ovest di Cefalù. Le origini del toponimo hanno dato luogo a diverse ipotesi; secondo Maurolico, la città potrebbe derivare dal monte chiamato Cratos, mentre un’altra interpretazione suggerisce il possibile riferimento al torrente Crati. Le prime tracce di frequentazione del territorio risalgono probabilmente alla tarda età del bronzo o all’inizio dell’età del ferro, testimoniata dal ritrovamento di reperti archeologici. Durante il periodo normanno, con l’arrivo di Roberto il Guiscardo nel 1059, il conte Ruggero I d’Altavilla conferì un nuovo assetto economico, sociale, giuridico e amministrativo alla Sicilia. In questo contesto, Gratteri ebbe un ruolo significativo con la nascita delle abbazie di Sant’Anastasia e San Giorgio, e la costruzione delle chiese di Sant’Elia, San Nicolò e Sant’Icono. Il primo signore di Gratteri, come riportato in un diploma della contessa Adelasia nel 1112, fu Guglielmo. Successivamente, il feudo passò ai signori di Monforte fino al 1250, quando Manfredi, figlio di Federico II, assegnò le terre di Gratteri e Isnello alla chiesa metropolitana di Palermo. In seguito, il feudo passò alla famiglia Ventimiglia, che si scontrò con il vescovo di Cefalù per il controllo del caricatoio di Roccella. Durante il periodo aragonese, Gratteri fu teatro di conflitti tra le truppe del re Pietro II e l’esercito siciliano guidato dai Ventimiglia. Nel XV secolo, con Alfonso d’Aragona, iniziò la baronia di Gratteri dei Ventimiglia, che influenzò la vita della comunità nei secoli successivi. Dal punto di vista urbanistico, secondo una descrizione del 1645 di Benedetto Passafiume, la città era suddivisa in un nucleo più antico, con un castello e mura, e un nucleo più recente che si sviluppò a partire dal XV secolo. Il centro medioevale si articolava attorno al castello, posizionato sulla rocca di San Vito, con un tracciato viario irregolare. La cinta muraria è scomparsa, ma il tracciato orientale è ancora visibile sul margine del torrente. Le principali vie di accesso erano quelle provenienti dalla contea di Collesano. Nel corso del tempo, si sviluppò la zona presso la chiesa di San Leonardo, con la costruzione di nuove chiese e l’espansione dell’abitato. La chiesa di San Michele Arcangelo, costruita nella metà del XIV secolo, divenne il nuovo centro del paese. Nel XV secolo, la chiesa di San Sebastiano diede origine a una nuova espansione dell’abitato a sud-est del castello, con i quartieri “di lu sciumi”, “di Fantina”, e “di San Sebastiano”. Successivamente, l’arrivo dei frati minori conventuali nel XVI secolo portò a una nuova espansione verso nord-est, dando origine alla “parte nuova” della città.
da Comune di Gratteri. (2024). Comune di Gratteri. https://www.comune.gratteri.pa.it/

Isnello

II.1.4.2 Basse Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	1.310 abitanti (01/01/2023 - Istat)
Superficie	51,00 km²
Densità	25,69 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.504

Dati geografici

Altitudine	530 m s.l.m. - minima: 295 - massima: 1.977
Coordinate Geografiche	*sistema sessagesimale* 37° 56’ 42,00’’ N - 14° 0’ 23,76’’ E *sistema decimale* 37,9450° N - 14,0066° E

Storia

Isineḍḍu in siciliano, è un comune italiano con una popolazione di 1.306 abitanti, situato nella città metropolitana di Palermo, in Sicilia. Il territorio di Isnello, caratterizzato da un significativo carsismo, presenta numerose cavità tra il pizzo Dipilo e il pizzo Carbonara. Nella zona del cozzo Balatelle si trova la Grotta “Abisso del Vento”, una profonda cavità in gran parte inesplorata, arricchita da stalattiti e stalagmiti. L’origine del nome del paese è stata oggetto di dibattito nel tempo, ma, sebbene non si sia giunti a una conclusione definitiva, si ritiene che derivi dalle caratteristiche del corso d’acqua che attraversa l’intero territorio. Ipotesi etimologiche includono il termine siriaco “hassin”, che significa fiume freddo, il punico “hassinor”, che indica un torrente che scorre in un alveo a forma di tubo, e il greco “asines”, che indica l’innocuità del torrente. Le informazioni sulla storia e sull’evoluzione dell’insediamento in epoca romana e nei primi secoli dell’era cristiana sono limitate. Durante questo periodo, la zona di Isnello era nota come Menzil Al-Hamàr, che significa villaggio fortificato. Dopo la sconfitta degli Arabi, il conte Ruggero fondò il nuovo borgo di Isnello, che venne aggregato alla diocesi di Messina rimanendo sotto il diretto dominio di Ruggero stesso. Ruggero II, primo Re di Sicilia, incluse Isnello nella nuova diocesi fondata nel 1131 con la Basilica Cattedrale di Cefalù. Il dominio su Isnello e la vicina Gratteri fu temporaneamente concesso dall’Imperatore Federico II all’Arcivescovo di Palermo, che successivamente chiese al figlio Manfredi di concedere perpetuamente il governo delle due baronie alla Chiesa Palermitana. La ragione per cui la Chiesa di Palermo perse la giurisdizione sui due centri non è nota. Nel 1296, la baronia di Isnello fu venduta da Niccolò Abbate a Francesco II Ventimiglia e Consolo, conte di Geraci. Successivamente, a causa di un crimine di tradimento, Antonio Ventimiglia perse i diritti sulle terre, che passarono al Regio fisco. Nel 1397, re Martino concesse la baronia di Isnello ad Abbo Filangeri, Alcaide di Cefalù, che la cedette successivamente per la Contea di San Marco. Nel 1788, i cittadini di Isnello, stanchi del dominio esercitato dai conti, ricomprarono i territori della contea, liberandosi definitivamente dall’autorità baronale. Dal punto di vista araldico, lo stemma comunale di Isnello è uno scudo su fondo rosso sormontato da una corona a tre torri, diviso in quattro fasce. La prima fascia raffigura un’aquila volante d’argento coronata del medesimo, la seconda è d’azzurro con una fascia d’oro e due stelle dorate a sei punte, la terza è dorata, e la quarta è azzurra con una stella dorata a sei punte. La corona muraria di città è d’oro. Il secondo campo riporta l’arma della nobile famiglia Termini, che ereditò la contea di Isnello da donna Giuseppa Valguarnera, ultima discendente diretta dei Santacolomba.
da Comune di Isnello. (2024). Comune di Isnello. https://www.comune.isnello.pa.it/

Pollina

II.1.4.2 Basse Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	2.850 abitanti (01/01/2023 - Istat)
Superficie	49,93 km²
Densità	57,08 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.800

Dati geografici

Altitudine	730 m s.l.m. - minima: 3 - massima: 762
Coordinate Geografiche	*sistema sessagesimale* 37° 59’ 40,92’’ N - 14° 8’ 45,96’’ E *sistema decimale* 37,9947° N - 14,1461° E

Storia

Conosciuta in siciliano come Pùḍḍina, Pollina è un comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 2.853 abitanti. Inserito all’interno del Parco delle Madonie, il territorio comunale di Pollina comprende i centri abitati di Pollina e Finale, oltre alle località di Costa Turchina, Nastasi e Rais Gerbi. La maggior parte della popolazione risiede nel centro abitato di Finale.
Una delle attività economiche più rilevanti per Pollina e per l’intero Parco delle Madonie è la coltivazione dei frassineti destinati alla produzione della manna, un presidio riconosciuto da Slow Food.
La manna è un prodotto tradizionale che ha radici antiche e profonde nella storia locale. Alcuni storici ipotizzano che Pollina possa essere la moderna erede di Apollonia, un’antica città della Magna Grecia, anche se non sono stati trovati reperti archeologici che confermino questa teoria. Nel 1321, il vescovo di Cefalù concesse la località al conte Francesco Ventimiglia, la cui famiglia mantenne la baronia fino all’abolizione del sistema feudale all’inizio del XIX secolo.
Lo sviluppo turistico di Pollina prese avvio negli anni ‘70 del Novecento, con la realizzazione di un teatro all’aperto noto come “Pietrarosa”, progettato dall’architetto Foscari. Questo teatro, ricavato da una roccia dolomitica e ispirato alle linee del teatro greco, rappresenta una peculiarità unica nel Mediterraneo.
Pollina è l’unico luogo in cui si è conservata la conoscenza e la tecnica per la produzione della manna.
Durante l’estate, attraverso incisioni nei tronchi di frassino, viene raccolto un liquido che, esposto all’aria, si condensa trasformandosi in manna. Questo prodotto, conosciuto come “miele di rugiada” o “miele di frassino”, veniva utilizzato fin dall’antichità in preparati medicinali dai greci e dai romani. Gli Arabi, invece, attribuivano alla manna proprietà spirituali e la consideravano benedetta, in quanto menzionata nel Corano.
da Comune di Pollina. (2024). Comune di Pollina. https://www.comune.pollina.pa.it/

San Mauro Castelverde

II.1.4.2 Basse Madonie

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	1.345 abitanti (01/01/2023 - Istat)
Superficie	114,37 km²
Densità	11,76 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	E
Gradi giorno	2.240

Dati geografici

Altitudine	1.050 m s.l.m. - minima: 9 - massima: 1.346
Coordinate Geografiche	*sistema sessagesimale* 37° 54’ 59,40” N - 14° 11’ 25,44” E *sistema decimale* 37,9165° N - 14,1904° E

Storia

Santu Màuru in siciliano, è un comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 1.346 abitanti. L’abitato si trova sul monte omonimo a circa 1.050 metri sul livello del mare, circondato dalle Madonie a ovest e dai Nebrodi a est. A nord, si affaccia sul Mar Tirreno, con vista su paesaggi locali e centri limitrofi come Pollina, Castelbuono, Gangi e Geraci Siculo.
Il comune è parte del Parco delle Madonie e dista circa 114 km dal capoluogo. Sotto il titolo di “Santo Mauro”, il paese ha una storia che risale all’epoca normanna, risultando registrato tra i manieri della contea di Geraci nella diocesi di Messina. La denominazione “San Mauro” potrebbe derivare dalla donazione di una reliquia del santo da parte dei monaci benedettini di un convento presente sul luogo. L’appellativo “Castelverde” fu aggiunto nel 1863 per distinguere il comune dagli altri paesi italiani con lo stesso nome.
Tale decisione fu presa in seguito all’unificazione del Regno d’Italia, quando la Prefettura di Palermo richiese l’aggiunta di un secondo nome. Il Consiglio Comunale deliberò l’identificativo “Castelverde” il 16 dicembre 1862.
La storia antica di San Mauro Castelverde, mescolandosi con leggende millenarie tramandate oralmente, attinge alle opere di autori locali come La Rocca e Leonarda per una maggiore affidabilità. Si ritiene che i primi abitanti siano stati i Greci, come indicato da antichi bevaio e strade.
Il periodo bizantino è testimoniato dalla chiesa di Santa Sofia o del Monte. Le prime fortificazioni e il castello, di probabile origine normanna, sono stati legati alla famiglia Ventimiglia dal 1296 al 1812. La leggenda di “Pietro Verde” narra la storia di un nobile feudale rifugiatosi in Sicilia nel VIII secolo.
Nell’età medievale, dopo l’occupazione saracena, San Mauro passò alla diocesi di Messina e divenne parte del regno aragonese dopo la rivoluzione dei Vespri nel 1282. Nel periodo moderno, il paese si ribellò ai Ventimiglia nel 1492 ottenendo agevolazioni nei giorni di mercato.
Nel corso degli anni, San Mauro Castelverde è passato attraverso diverse fasi politiche, incluso il periodo borbonico e la legge Zanardelli del 1890 che portò alla soppressione della Pretura.
da Comune di San Mauro Castelverde. (2024). Comune di San Mauro Castelverde. https://www.comune.sanmaurocastelverde.pa.it/

Fig. II.1.4.1.3 | Basse Madonie. ©2021, Luisa Lombardo

Aliminusa

II.1.4.3 Madonie Imeresi

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	1.055 abitanti(01/01/2023 - Istat)
Superficie	13,68 km²
Densità	77,12 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	C
Gradi giorno	1.326

Dati geografici

Altitudine	450 m s.l.m. - minima: 120 - massima: 1.133
Coordinate Geografiche	*sistema sessagesimale* 37° 51’ 54,00” N - 13° 46’ 55,56” E *sistema decimale* 37,8650° N - 13,7821° E

Storia

Larminusa in siciliano, si affaccia sul versante opposto al monte San Calogero, noto anche come Euracus (1.326 m). Il toponimo “Aliminusa” compare per la prima volta nel testamento di Matteo Sclafani del 1333, in cui dichiara di aver acquistato il feudo e il casale di Rachalminusa (il prefisso “rachal” in arabo significa casale o villaggio) dal figlio di Gualtiero Fisaula, Giovanni. Questo avvenimento è documentato nell’atto redatto da Giovanni di Siracusia. A partire dalla prima metà del XIV secolo, Rachalminusa segue gli eventi della Contea di Sclafani. Inizialmente di proprietà di Matteo Sclafani, conte di Adernò, il feudo passa successivamente alle figlie Luisa e Margherita, rispettivamente sposate a Guglielmo Peralta e Guglielmo Raimondo Moncada. Dopo un breve periodo in cui la contea viene concessa ai Moncada per volere del Re Martino, ritorna sotto il controllo dei Peralta nel 1396, quando Nicolò Peralta ottiene il diritto di esercitare il mero e misto imperio su tutta la contea di Sclafani. Nel XV secolo, una carta conservata negli Uffizi Fiorentini con il titolo di “Terrae harminusae” fa riferimento al feudo di Rachalminusa, storpiato in “harminusae” dai locali. Nel Quattrocento, Sancho Ruiz de Lihori de Lihori, figlio del governatore di Aragona, acquisisce la Contea di Sclafani nel 1400. Tuttavia, nei primi anni del secolo successivo, cede la contea a Don Giacomo de Prades, che a sua volta la vende nel 1406 ad Enrico Rubbes (Russo), barone di Caltavuturo. Dopo alcune vicissitudini ereditarie, nel 1442 la Contea di Sclafani passa ad Antonio Spatafora Russo. Nel Cinquecento, durante il regno di Giovanni II, i Luna vengono esiliati dal regno e i loro beni confiscati per evitare conflitti con i Perollo durante il primo Caso di Sciacca. Nel 1519, Gian Vincenzo de Luna si investe della Contea di Sclafani. Nel Seicento, il governo concede ai baroni la facoltà di fondare nuovi centri abitati nei loro feudi. Nel 1620, la Contea di Sclafani viene smembrata, dando origine ai comuni di Aliminusa, Scillato, Sclafani e Valledolmo. Nel Settecento, il latifondo e il divario socioeconomico diventano evidenti in Sicilia. La maggior parte del suolo è divisa in latifondi e feudi nobili, contribuendo alla povertà della popolazione. Il feudo di Aliminusa passa attraverso diverse mani nel corso dei secoli, includendo i Cutelli, i Recupero, e infine i Milone. Nel 1750, il feudo viene ceduto al principe Ignazio Vincenzo Paternò, Principe di Biscari, che lo cede successivamente a Gerolamo Recupero e Bonaccorsi nel 1766. La baronia e la terra di Aliminusa passano poi al fratello Giuseppe Recupero e Zappalà nel 1796. Il XIX secolo è caratterizzato dal tentativo di riforme agrarie, inclusa la redistribuzione delle terre, per affrontare il problema del latifondo e della povertà diffusa.
da Comune di Aliminusa. (2024). Comune di Aliminusa. https://www.comunedialiminusa.it/

Caccamo

II.1.4.3 Madonie Imeresi

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	7.681 abitanti (01/01/2023 - Istat)
Superficie	188,23 km²
Densità	40,81 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.531

Dati geografici

Altitudine	521 m s.l.m. - minima: 79 - massima: 1.311
Coordinate Geografiche	*sistema sessagesimale* 37° 56’ 1,32” N - 13° 39’ 56,88” E *sistema decimale* 37,9337° N - 13,6658° E

Storia

Noto anche come Càccamu in siciliano, il comune è membro dell’Unione dei Comuni della Bassa Valle del fiume Torto. Il centro abitato di Caccamo si trova ai piedi del Monte San Calogero, nel tratto inferiore della ex valle del fiume San Leonardo, ora conosciuta come lago di Rosamarina. Quest’ultimo, con una capacità di circa 100 milioni di metri cubi d’acqua, rappresenta la principale risorsa idrica nella regione di Palermo. Caccamo è circondato a est dalla riserva naturale orientata del Monte San Calogero, a ovest dalla riserva naturale orientata Pizzo Cane, Pizzo Trigna e Grotta Mazzamuto, e si affaccia sul Mar Tirreno. Con un territorio esteso di circa 19.000 ettari, Caccamo confina con altri quattordici comuni. Le origini di Caccamo hanno suscitato l’interesse di autorevoli studiosi, secondo la leggenda, la città fu fondata intorno al IV-V secolo a.C. dai Cartaginesi in fuga dopo la sconfitta del 480 a.C. a Himera. Le tracce storiche indicano che la zona era abitata fin dai tempi antichi, come dimostrato dalle sepolture a forno note come “grotticelle” sparse nel territorio. Il periodo della dominazione araba fu particolarmente travagliato, segnato dalla rivolta dei berberi girgentani dal 939 al 940. La configurazione abitativa cambiò durante questo periodo, con Petterana come nucleo principale, decadenza nel XII secolo e crescita del Castello. Nel 1094, la città fu concessa in feudo a Goffredo de Sagejo, un signore normanno. Dopo circa mezzo secolo, passò alla famiglia Bonello. Durante il dominio dei Bonello, il castello subì ampliamenti e abbellimenti, diventando rifugio durante rivolte contro Re Guglielmo I. Il castello tornò poi a essere possedimento reale fino alla morte di Guglielmo I, quando passò a Giovanni Lavardino. Con il regno di Federico Chiaramonte iniziò il periodo di sviluppo economico, nuovi monumenti, e ampliamento del castello. Nel 1302, Caccamo resistette all’assalto degli angioini e la signoria venne elevata a Contea, prendendo il nome di Chiaramonte. Dopo varie vicissitudini, nel 1641, Caccamo fu elevata al rango di città e conobbe un periodo di splendore sotto la signoria di Henriquez-Cabrera. La città si sviluppò urbanisticamente, vi furono erette nuove chiese, e nel 1643 ricevette tutti gli onori e privilegi delle altre città del Regno. Nel 1646, la famiglia Amato prese il controllo della città, elevando la contea a ducato. Dopo l’estinzione della famiglia Amato, nel 1813 la signoria passò alla famiglia De Spuches. La città partecipò attivamente agli avvenimenti che portarono all’unità d’Italia. Nel 1967, il Castello fu ceduto alla Regione in cambio di 40 milioni, segnando l’inizio di progetti per trasformarlo in una struttura culturale.

da Comune di Caccamo. (2024). Comune di Caccamo. https://comune.caccamo.pa.it/

Caltavuturo

II.1.4.3 Madonie Imeresi

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	3.558 abitanti (01/01/2023 - Istat)
Superficie	97,95 km²
Densità	36,33 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.664

Dati geografici

Altitudine	635 m s.l.m. - minima: 138 - massima: 1.080
Coordinate Geografiche	*sistema sessagesimale* 37° 49’ 19,20” N - 13° 53’ 27,60” E *sistema decimale* 37,8220° N - 13,8910° E

Storia

Cartavuturu in siciliano, sovrastato dalla Rocca di Sciara, si è evoluto come antica roccaforte presumibilmente di origine bizantina, subendo nel corso dei secoli varie dominazioni. Gli abitanti sono comunemente noti come caltavuturesi (cartavutrisi in siciliano). Risulta interessante un passo di Diodoro Siculo, che menziona scontri armati avvenuti attorno al 306 a.C. tra Agatocle e Dinocrate, citando il monte Gorgium e il centro di Ambica. Il primo potrebbe essere identificato con la montagna sopra Caltavuturo, mentre il secondo corrisponderebbe all’odierno centro abitato di Sclafani Bagni, entrambi appartenenti alla valle di Himera. La presenza di una pianura chiamata “chiana chianta” da parte dei caltavuturesi è un elemento intrigante, il cui significato potrebbe essere “pianta piana” o, secondo altre interpretazioni, “piana del pianto,” riferendosi a una battaglia antica narrata anche nei miti locali. Questo dettaglio apre la possibilità di un’origine ancor più antica rispetto all’epoca bizantina, sebbene senza prove concrete. La datazione del primo insediamento è sfumata nel tempo, ma i primi reperti datati possono essere attribuiti al periodo bizantino, tra il VI e il VII secolo, durante il comando di Giorgio Maniace, comandante bizantino e discendente della famiglia Imperiale di Bisanzio. L’origine della città, secondo alcune teorie, è associata alla dominazione araba, sostenendo che il nome derivi dalla parola araba Qal‘at Abī l-Thawr (roccaforte di Abū Thawr), il condottiero musulmano che ne prese il controllo. Tuttavia, tale versione presenta incongruenze storiche. Altri studiosi suggeriscono che il nome derivi dalla combinazione delle parole arabe “qal‘at” (rocca) e siciliana “vuturu/vuturuni” (avvoltoio/grifone), assumendo il significato di “Rocca dell’Avvoltoio,” in riferimento al rapace endemico presente nella regione. In conformità con questa seconda versione, lo stemma del paese raffigura una torre medievale con un grifone posato su di essa. Secondo lo storico Ibn al-Athir, nell’811/812 d.C., nei pressi dell’attuale Caltavuturo, si svolse una battaglia tra forze bizantine e aghlabite durante la conquista islamica della Sicilia. Durante la dominazione normanna, il paese appartenne alla famiglia del conte Ruggero, passando poi sotto il controllo dei Ventimiglia sotto gli Svevi. Diverse famiglie si succedettero sino al XVI secolo. Nel 1550, parte degli abitanti si trasferì al di fuori delle mura, a una quota inferiore rispetto al terrazzo roccioso della “Terravecchia,” che rappresenta il nucleo originario. Il 20 gennaio 1893, durante la rivolta dei fasci siciliani, 500 contadini che simbolicamente occuparono alcune terre furono dispersi da soldati e carabinieri, con tredici manifestanti che persero la vita durante gli scontri.
da Comune di Caltavuturo. (2024). Comune di Caltavuturo https://www.comune.caltavuturo.pa.it/

Montemaggiore Belsito

II.1.4.3 Madonie Imeresi

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	2.954 abitanti (01/01/2023 - Istat)
Superficie	32,08 km²
Densità	92,10 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.430

Dati geografici

Altitudine	517 m s.l.m. - minima: 196 - massima: 1.145
Coordinate Geografiche	*sistema sessagesimale* 37° 50’ 51,00” N - 13° 45’ 43,56” E *sistema decimale* 37,8475° N - 13,7621° E

Storia

Muntimajuri in siciliano, è un comune italiano con una popolazione di 2.979 abitanti, situato nella città metropolitana di Palermo, in Sicilia. La località dista 70 km da Palermo. Reperti archeologici attestano che l’insediamento nel territorio di Montemaggiore Belsito risale almeno al XII secolo, con la presenza di un “casale” (piccolo centro abitato rurale). Quest’area fu inizialmente controllata dai Bizantini e successivamente dagli Arabi, durante la loro invasione della Sicilia. Si ipotizza, in base ai ritrovamenti archeologici, la presenza degli Arabi nel territorio di Montemaggiore. Nella seconda metà del XIII secolo, come molte terre dell’isola in quel periodo, Montemaggiore fu ripopolato da contadini montanari delle Madonie, a seguito di un graduale spopolamento derivato dall’abbandono di un monastero cluniacense presente nella zona. Alla fine del XIII secolo, Montemaggiore era già elevato al rango di “terra.”
A partire dal 1410, viene menzionato un monastero benedettino fondato dai Ventimiglia. Durante questo periodo, Montemaggiore era un feudo appartenente a Riccardello Filangeri, che lo aveva ottenuto dal conte Francesco Ventimiglia nel XIV secolo in cambio del castello di Sperlinga. Da questo periodo fino alla seconda metà del XVI secolo, Montemaggiore non mostrò segni significativi di ripopolamento. Nel 1598, Montemaggiore fu elevato a “Marchesato” per concessione di re Filippo II a favore di Mariano Migliaccio Ventimiglia. Montemaggiore, nonostante la sua posizione nell’entroterra isolano, fu coinvolto nel processo di urbanizzazione territoriale della Sicilia tra il XVI e il XVIII secolo, soprattutto prima del 1600, a causa del fenomeno dell’emigrazione interna. Nel 1624, Montemaggiore contava 185 case e 964 abitanti, saliti a 303 case e 1.260 abitanti nel 1652. Il centro abitato, nel XVII secolo con un monastero benedettino e almeno tre chiese, continuò a crescere grazie al suo vasto e fertile territorio, attirando la popolazione contadina dei centri madoniti circostanti. Nel 1851, una frana cancellò in parte il centro abitato. A quel tempo, prevaleva la presenza di “case terrane,” di concezione semplice e adibite a tutte le funzioni dell’abitare, caratteristiche delle abitazioni dei meno abbienti. La classe medio-borghese, che avrebbe dato vita a un’edilizia meno umile, emerse solo molto più tardi nel Settecento. L’idea di abitazione come espressione di uno stato sociale si delineò nel Settecento, ma a Montemaggiore Belsito rimase un aspetto marginalmente rilevante. Gli elementi che emergono dal tessuto urbano includono le chiese, il palazzo del principe di Baucina e il palazzo Saeli, quest’ultimo costruito agli inizi del XX secolo. Dopo l’Unità d’Italia, al nome originario di Montemaggiore fu aggiunto il termine Belsito.
da Comune di Montemaggiore Belsito. (2024). Comune di Montemaggiore Belsito. https://www.comune.montemaggiorebelsito.pa.it/

Scillato

II.1.4.3 Madonie Imeresi

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	593 abitanti (01/01/2023 - Istat)
Superficie	31,70 km²
Densità	18,71 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	C
Gradi giorno	1.009

Dati geografici

Altitudine	218 m s.l.m. - minima: 94 - massima: 1.794
Coordinate Geografiche	*sistema sessagesimale* 37° 51’ 27,36” N - 13° 54’ 25,92” E *sistema decimale* 37,8576° N - 13,9072° E

Storia

Conosciuto in siciliano come Sciḍḍatu, Scillato è un comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 618 abitanti. Questo borgo è parte integrante del Parco delle Madonie e si trova a circa 60 km da Palermo, sui primi contrafforti occidentali delle Madonie. La zona è caratterizzata da abbondanti sorgenti d’acqua, ed è circondata dai monti dei Cervi, Fanusi e dal Cozzo di Castellazzo. Le origini di Scillato sono strettamente legate alla presenza delle sue risorse idriche, che sono state storicamente sfruttate per la costruzione di numerosi mulini. Intorno a questi mulini, il centro abitato ha preso forma. Il primo riferimento documentato a un mulino in questa località risale al 1156, mentre il nome Scillato (Xillatum) appare in documenti della fine del XII secolo. Tuttavia, alcuni storici locali hanno ipotizzato che le origini del borgo possano essere ancora più antiche, collegandolo addirittura a una colonia di greci ateniesi che si sarebbe insediata in queste colline dopo la distruzione di Troia. Nonostante la sua lunga storia, Scillato ha mantenuto la sua identità di borgo rurale, senza essere coinvolto in eventi di grande rilevanza storica. Ha vissuto sotto diverse signorie, seguendo le sorti della Sicilia. Fino al 1961, Scillato era una frazione di Collesano, ottenendo poi l’autonomia amministrativa con la Legge regionale n. 8, in vigore dall’11 aprile dello stesso anno.
da Comune di Scillato. (2024). Comune di Scillato. https://www.comunescillato.pa.it/

Sclafani Bagni

II.1.4.3 Madonie Imeresi

Città metropolitana	Palermo (PA)
Regione	Sicilia
Popolazione	374 abitanti (01/01/2023 - Istat)
Superficie	134,90 km²
Densità	2,77 ab./km²

Classificazione sismica e climatica

Zona sismica	2
Zoma climatica	D
Gradi giorno	1.927

Dati geografici

Altitudine	755 m s.l.m. - minima: 118 - massima: 1.132
Coordinate Geografiche	*sistema sessagesimale* 37° 49’ 22,08’’ N - 13° 51’ 20,16’’ E *sistema decimale* 37,8228° N - 13,8556° E

Storia

Comune italiano situato nella città metropolitana di Palermo, in Sicilia, con una popolazione di 375 abitanti. Si configura come il comune meno popolato della città metropolitana palermitana. L’aggettivo “Bagni” è stato aggiunto nel 1954 con la Legge regionale n. 69/53 per evidenziare la presenza di una sorgente naturale di acqua calda nelle campagne, la quale, nei secoli precedenti, è stata oggetto di tentativi di sfruttamento termale. Sclafani Bagni fa parte del Parco delle Madonie. Le origini di Sclafani sono state oggetto di speculazioni prive di solide basi da parte degli eruditi locali, che hanno fatto riferimento a un passo di Diodoro Siculo. Nel suo resoconto sugli scontri avvenuti intorno al 306 a.C. tra Agatocle e Dinocrate, viene menzionato il monte Gorgium e il centro di Ambica: il primo è identificabile con la montagna sopra Caltavuturo, mentre il secondo corrisponderebbe al centro abitato di Sclafani.
La posizione di Sclafani, strategicamente situato nell’entroterra di Imera, indica la possibilità di un insediamento di tipo militare in epoca antica per il controllo delle vie di penetrazione verso l’interno, ma mancano prove archeologiche a sostegno di questa ipotesi. L’etimologia del nome è stata associata a un presunto Aesculapiii Fanum (tempio di Esculapio), mentre la denominazione araba è stata indicata come ‘Isqlafinah o Sqlafiah. Il primo riferimento documentato a Sclafani risale alla Cronaca di Cambridge del 938, in cui viene menzionato un episodio legato alle lotte fra fazioni musulmane per il controllo della Sicilia.
Successivamente alla conquista normanna (1060-1091), Sclafani fu assegnata a vari signori, tra cui Giordano d’Altavilla, Matilda (sorella di Giordano), Adelasia (figlia di Giordano), Giovanni di Sclafani, e Goffredo di Montescaglioso. Nella prima metà del XIV secolo, il feudo appartenne a Matteo Sclafani, conte di Adernò, noto per la costruzione di palazzo Sclafani a Palermo nel 1330. Durante questo periodo, il centro abitato si espanse, venne costruita una cinta muraria e il castello fu rimaneggiato.
Tuttavia, la morte di Matteo Sclafani senza eredi maschi portò a dispute tra le famiglie Peralta e Moncada, che si contendevano il feudo. Nel Cinquecento e Seicento, la contea di Sclafani subì progressivamente una suddivisione attraverso la vendita di terreni e fondi. Contrariamente ad altri centri delle Madonie, la popolazione non aumentò significativamente, soprattutto a causa della fondazione di nuovi insediamenti nel territorio circostante. Questa tendenza si invertì solo agli inizi del Novecento.
da Comune di Sclafani Bagni. (2024). Comune di Sclafani Bagni. https://comune.sclafanibagni.pa.it/

Fig. II.1.4.1.4 | Madonie Imeresi. ©2021, Luisa Lombardo

II.1.5 Valorizzazione del paesaggio rurale

L'Italia e l'Europa si distinguono per una configurazione territoriale che esprime una forte ruralità (Alison, 2016), caratterizzata dalla presenza diffusa di piccoli paesi caratterizzati da architetture vernacolari e un'alta qualità paesaggistica (Ausiello, 1999). Anche la Sicilia riflette questa peculiarità nelle sue vaste aree interne, in cui si sviluppa un patrimonio insediativo e culturale di grande rilievo, capace di contribuire in modo significativo alla definizione del paesaggio rurale italiano (Barbieri, 1970). Questo patrimonio rappresenta non solo un'eredità storica, ma anche un elemento vivo del territorio, in cui le attività economiche tradizionali, il lavoro delle comunità locali e le pratiche culturali continuano a influenzare la forma e l'uso del paesaggio.

L'isolamento geografico della Sicilia, dovuto alla sua condizione insulare, ha determinato uno sviluppo urbano concentrato principalmente lungo le aree costiere, mentre le zone interne – come il comprensorio delle Madonie – hanno mantenuto una marcata vocazione rurale, testimoniando l'interdipendenza storica tra le comunità locali e il loro ambiente naturale. Secondo il "Factsheet on 2014-2020 Rural Development Program for Sicily" della Commissione Europea, il 97% del territorio siciliano è classificato come rurale, con il 68,5% destinato all'agricoltura e il 15% alle attività forestali. Questa prevalenza di aree rurali sottolinea l'importanza di uno sviluppo sostenibile che tenga conto delle peculiarità locali (Bonesio, 2005). Il comprensorio delle Madonie, che rientra in questa classificazione, costituisce un sistema territoriale montano con una fitta rete di piccoli insediamenti diffusi, di cui 16 comuni su 21 contano meno di 5.000 abitanti. La sua organizzazione territoriale è fortemente radicata nella struttura montana e nella tradizione agro-pastorale (Biasutti, 1924), rendendolo un esempio emblematico di territorio "diffuso" caratterizzato da una bassa densità abitativa (Albani et al., 2013), ricchi paesi e tantissimi beni isolati sparsi nel territorio[1].

L'analisi storica dell'area delle Madonie evidenzia come le comunità locali abbiano sviluppato un rapporto profondo e di reciproco adattamento con l'ambiente naturale, utilizzando in modo strategico le risorse disponibili e plasmando un paesaggio fatto di elementi architettonici e paesaggistici unici (Coletta, 2005). Uno degli aspetti più caratteristici di queste aree è la presenza di beni isolati sparsi nel territorio, costruiti in funzione delle necessità agricole, pastorali e di presidio del territorio (Cosenza, 1994). Questi beni – come abbeveratoi, santuari, case cantoniere e, in particolare, masserie e pagliai – non solo arricchiscono il paesaggio rurale, ma ne rappresentano anche i principali punti di riferimento (De Nardi, 2013). Le **masserie** costituiscono il cuore di questo sistema insediativo (Musotto, 1998): si tratta di complessi rurali autosufficienti, dotati di strutture per l'abitazione, il ricovero degli animali e la trasformazione dei prodotti agricoli, che hanno rivestito per secoli un ruolo cruciale nello sviluppo delle attività agricole e pastorali, a volta fortificate.

[1] Ministero della Cultura. (2023). Tutela e valorizzazione dell'architettura e del paesaggio rurale. Piano Nazionale di Ripresa e Resilienza. Retrieved September 16, 2024, from https://pnrr.cultura.gov.it/misura-2-rigenerazione-di-piccoli-siti-culturali-patrimonio-culturale-religioso-e-rurale/2-2-tutela-e-valorizzazione-dellarchitettura-e-del-paesaggio-rurale/

Fig. II.1.4.1 | Quadro sinottico degli interventi per il patrimonio rurale del PNRR. ©2021, PNRR

I **pagliai**, invece, rappresentano un'architettura rurale (*Fig. 1*) caratteristica e funzionale, utilizzata principalmente come ricovero per animali e pastori (De Paoli, 2013). Queste strutture, costruite in pietra a secco e materiali naturali, sono esempi di come le comunità locali abbiano saputo adattare le proprie tecniche costruttive alle esigenze climatiche e ambientali, garantendo protezione dagli agenti atmosferici e un riparo per le attività pastorali. Le mannare, grandi ovili realizzati in pietra a secco, sono un ulteriore esempio di architettura vernacolare al servizio dell'economia locale: concepite per rispondere alle esigenze del mondo pastorale, le mannare sono organizzate con recinti e spazi funzionali per la mungitura, la tosatura e la produzione casearia, dimostrando una profonda conoscenza delle dinamiche del lavoro pastorale e un attento uso delle risorse territoriali. Oltre agli edifici abitativi e pastorali, la pietra a secco viene utilizzata anche per la realizzazione di infrastrutture agricole come i terrazzamenti e i muretti a secco (Alessandrini, 2001), che nel corso dei secoli hanno contribuito a modellare il paesaggio agricolo delle Madonie.

Le **case cantoniere**, tipiche del paesaggio siciliano, sono edifici funzionali destinati originariamente alla sorveglianza e manutenzione delle vie di comunicazione. Queste strutture, che spesso si trovano ai margini di strade rurali, costituiscono un esempio di come l'architettura vernacolare rispondesse anche alla necessità di controllo del territorio. I santuari, disseminati nelle zone montane e rurali, rappresentano luoghi di culto che hanno radici nella spiritualità popolare e nell'identità culturale delle comunità locali. Questi edifici, costruiti con materiali facilmente reperibili sul posto, sono spesso inseriti in paesaggi mozzafiato, simboleggiando il legame tra la religiosità delle persone e l'ambiente naturale circostante.

Castelli e fortificazioni, seppur meno numerosi, sono testimonianze di una Sicilia che, nei secoli, ha vissuto periodi di dominazione e conflitto. Spesso situati in posizioni strategiche, questi edifici difensivi sono veri e propri esempi di come l'architettura abbia risposto alle necessità di difesa e controllo del territorio. I mulini a vento e i mulini ad acqua, simbolo delle tecniche tradizionali di sfruttamento delle risorse naturali, sono stati fondamentali per l'economia rurale siciliana. Questi edifici, con la loro struttura caratteristica e l'impiego di fonti di energia rinnovabili, sono il cuore pulsante della storia agricola e industriale delle Madonie, utilizzati per la macinazione dei cereali e per altre attività produttive.

Anche i **ponti medievali**, alcuni dei quali ancora visibili nel territorio delle Madonie, sono esempi significativi di architettura funzionale e duratura, che collegavano le comunità isolate attraverso la rete di vie di comunicazione rurali. Questi, spesso realizzati in pietra locale, sono non solo strutture di collegamento, ma anche elementi che riflettono l'ingegnosità delle comunità nell'adattarsi alla geografia del territorio (*Fig. 3*).

In questo contesto, l'**architettura vernacolare** (Di Pasquale et al., 2016) emerge come una delle più autentiche manifestazioni del legame tra uomo e ambiente. Evolutasi nel corso dei secoli attraverso l'uso di materiali e tecniche locali, permette alle costruzioni di integrarsi nel paesaggio senza alterarne l'equilibrio estetico e visivo. Questo approccio risponde non solo a esigenze pratiche e climatiche, ma rappresenta anche una forma di bioarchitettura *ante litteram*, che impiega materiali rinnovabili e facilmente reperibili per creare edifici sostenibili e duraturi (Ferrara et al., 2003).

Nel complesso, il sistema insediativo delle Madonie è caratterizzato da un sottile equilibrio tra aree urbanizzate e paesaggio naturale. Molti dei piccoli centri abitati hanno origini difensive e furono costruiti in posizioni strategiche, seguendo le esigenze di presidio del territorio e in perfetta armonia con le caratteristiche geomorfologiche locali. La parte centrale del comprensorio presenta una minore densità insediativa, mentre le aree prossime alle principali vette dell'Appennino siciliano mostrano una maggiore concentrazione di nuclei abitati, evidenziando la capacità delle comunità locali di integrarsi con l'ambiente circostante e di sviluppare un sistema insediativo flessibile e adattabile alla conformazione del territorio (La Regina, 1980).

La sapienza costruttiva delle comunità delle Madonie (Rudofsky, 1964), così come di molte altre aree interne della Sicilia (Leone, 2009), si riflette in un patrimonio edilizio che non solo soddisfa esigenze pratiche e funzionali, ma dialoga in modo profondo e armonioso con il paesaggio naturale. L'utilizzo di materiali locali, quali la pietra, il legno, la paglia e il laterizio, è stato scelto non solo per la loro disponibilità e reperibilità, ma anche per le loro peculiarità adattive alle condizioni climatiche, geografiche e culturali specifiche di ogni territorio. Questi materiali sono diventati simbolo di un'architettura che ha saputo rispondere alle necessità pratiche delle comunità, senza compromettere l'estetica e l'integrazione nel contesto naturale circostante (Mercadal, 1984). Grazie alla loro resistenza, sostenibilità e capacità di "respirare", queste costruzioni hanno avuto una ridotta impronta ecologica, contribuendo a preservare le caratteristiche visive, ambientali e storiche del paesaggio, mantenendo intatta la qualità estetica del territorio e delle tradizioni locali.

Questa architettura è anche il risultato di una continua interazione tra le esigenze funzionali della vita quotidiana e le sfide poste dal territorio montano delle Madonie (Pagano, 1935). Le comunità locali, con grande capacità di adattamento e ingegno, sono riuscite a ottimizzare l'uso delle risorse disponibili, sviluppando un sistema costruttivo che non solo rispondeva alle necessità di difesa, abitazione e lavoro, ma che era anche capace di resistere

Fig. II.1.4.2 | Paesaggio rurale ©Quelli del Parco delle Madonie, 2023

alle mutevoli condizioni ambientali e alle difficoltà derivanti da un territorio aspro e selvaggio. I materiali impiegati, come la pietra locale, venivano spesso utilizzati con tecniche tradizionali che sfruttano al meglio le loro proprietà fisiche. Al contempo, le forme e le tipologie architettoniche si adattavano alla geografia dei luoghi, dalle masserie, alle case cantoniere, ai rifugi, ai mulini a vento e ad acqua, fino ai ponti medievali, creando una rete di edifici che, pur diversificati nella loro funzione, si integravano perfettamente con il paesaggio naturale (Ragni, 2011).

Nel Parco delle Madonie, la tradizione pastorale e l'economia agricola hanno svolto un ruolo determinante nello sviluppo delle tecniche edilizie, creando un patrimonio che riflette tanto l'ingegno umano quanto l'adattamento alle condizioni naturali. Questo patrimonio edilizio costituisce una risorsa straordinaria per lo sviluppo sostenibile del territorio e per la valorizzazione del paesaggio culturale che caratterizza la regione. Il recupero delle antiche tecniche edilizie, in chiave innovativa e sostenibile, non solo potrebbe dare nuovo impulso all'economia locale, ma contribuirebbe anche a rafforzare la coesione sociale, migliorando la qualità della vita delle comunità che vivono in queste aree interne (Valussi, 1968).

Tale approccio integrato vede l'architettura rurale come un elemento fondante di un paesaggio culturale che è tanto la memoria storica di un territorio quanto un elemento chiave per la sua sostenibilità futura. Il Piano Nazionale di Ripresa e Resilienza (PNRR) ha dedicato particolare attenzione alla valorizzazione dell'architettura rurale, riconoscendo l'importanza di preservare l'intero paesaggio rurale, dai paesi ai beni isolati, che spesso sono stati trascurati a favore di un intervento concentrato sui centri storici. L'obiettivo del PNRR non è solo quello di recuperare il patrimonio edilizio, ma anche di superare le disuguaglianze territoriali, promuovendo un modello di sviluppo che unisca la conservazione del paesaggio e la crescita economica nonchè promuovere un sistema diffuso in tutto il bacino del Mediterraneo (Riberio, 1972).

Le sfide principali dell'intervento sono molteplici e riguardano sia la conservazione degli elementi distintivi dei paesaggi storici rurali, con un'attenzione particolare alla distribuzione degli edifici, sia il recupero di edifici che hanno subito degrado, abbandono o alterazioni nel tempo. In particolare, il Parco delle Madonie, con la sua rete di beni isolati richiede un'attenzione speciale per evitare che queste testimonianze di architettura vernacolare vadano perse. Le sfide includono la promozione di opportunità di lavoro nei settori agricolo, edilizio e turistico, rafforzando le economie rurali e mitigando gli effetti della crisi sociale ed economica, accentuata dalla pandemia.

Un altro obiettivo fondamentale dell'intervento è la creazione di un sistema integrato che supporti la valorizzazione turistica e culturale del territorio. Il PNRR (*Fig. 2*) dedica un investimento complessivo di 600 milioni di euro all'Italia, con 590 milioni destinati al recupero di insediamenti agricoli e fabbricati rurali storici, e 10 milioni al censimento e alla creazione di sistemi informativi. Questi interventi mirano a valorizzare non solo le strutture più visibili e conosciute, ma anche quelle più isolate, questo tipo di interventi è stato supportato previa la presentazione di un progetto da privati che garantiva non solo il recupero della struttura, ma anche la possibilità di ampliare l'offerta turistica prevedendo non solo un'attività commerciale, ma anche l'uso di fonti energetiche rinnovabili e di sistemi di trasporto sostenibile per esplorare e valorizzare il territorio. I comuni del Parco delle Madonie, tra cui Polizzi Generosa[2], Isnello, Gratteri e San Mauro Castelverde, inoltre sono stati inclusi nel Bando PNRR – Linea B, con interventi concreti che hanno riguardato sia il recupero edilizio che la valorizzazione di beni culturali immateriali, come festival, mostre e attività culturali che rafforzano il legame con la comunità locale.

I progetti non solo hanno stimolato l'economia locale, ma hanno creato anche importanti nuove opportunità di lavoro, migliorando la qualità del paesaggio e contribuiscono a un più ampio processo di inclusività, promuovendo un turismo che rispetti e valorizzi la cultura locale. L'intervento si è

[2] Madonie Live. (2022, 24 giugno). Polizzi Generosa in graduatoria nell'attrattività dei borghi previsto dal PNRR. Madonie Live. https://madonielive.com/2022/06/24/polizzi-generosa-in-graduatoria-nell-attrattivita-dei-borghi-previsto-dal-pnrr/

concentrato sulla riqualificazione di edifici pubblici e privati, in particolare quelli abbandonati o in stato di degrado, con l'obiettivo di restituire alla comunità un patrimonio edilizio che è stato a lungo inaccessibile (Sabatino, 2013).

Nel complesso, il recupero e la valorizzazione del patrimonio rurale delle Madonie ha rappresentato un'occasione unica per ripensare il futuro del territorio, promuovendo un modello di sviluppo che rispetti l'ambiente, la cultura e le tradizioni, e che allo stesso tempo crei opportunità economiche sostenibili per le generazioni future; quattro comuni, tuttavia, non sono sufficenti per la rinascita dei territori. La sinergia tra il recupero delle architetture rurali e la promozione del paesaggio come risorsa culturale ed economica sarà fondamentale per costruire una visione di futuro che sia rispettosa delle tradizioni, ma aperta alle innovazioni necessarie per il benessere delle comunità locali e per il rilancio dell'intero territorio.

Di seguito verrà presentata un'analisi esaustiva dei comuni afferenti all'area delle Madonie, esaminando ciascun comune singolarmente per comprendere le analogie, le differenze e le peculiarità territoriali. Questo studio dettagliato permetterà di evidenziare le specificità di ogni località, non solo in termini di patrimonio architettonico e paesaggistico, ma anche relativamente alle dinamiche socio-economiche, alle tradizioni locali e alle potenzialità di sviluppo. Attraverso questa analisi, sarà possibile formulare strategie di valorizzazione mirate, che considerino le caratteristiche uniche di ciascun comune, rafforzando il legame tra il patrimonio rurale e le opportunità di crescita sostenibile per l'intero territorio delle Madonie.

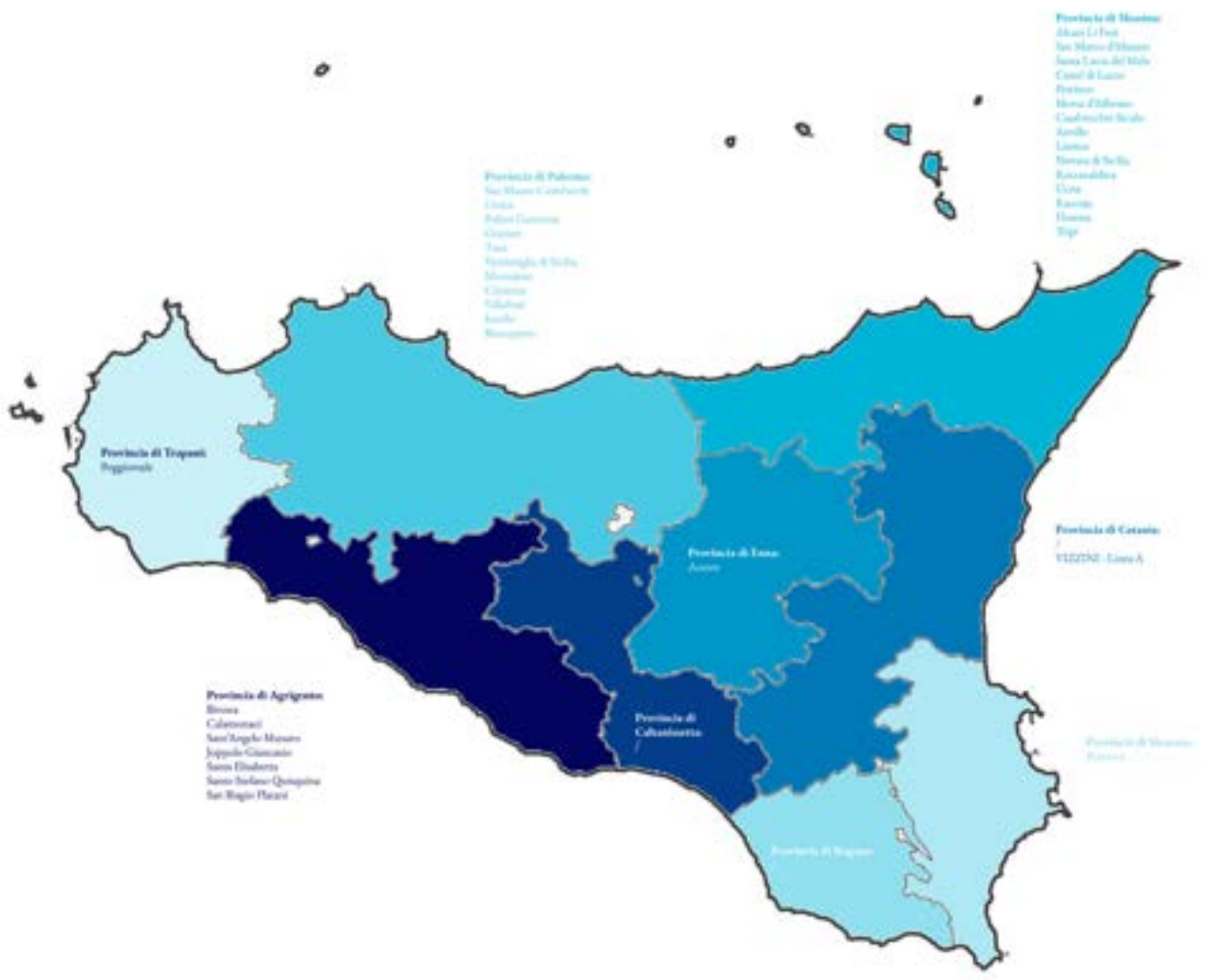


Fig. II.1.4.3 | Paesi vincitori del Bando Borghi ©Luisa Lombardo, 2024

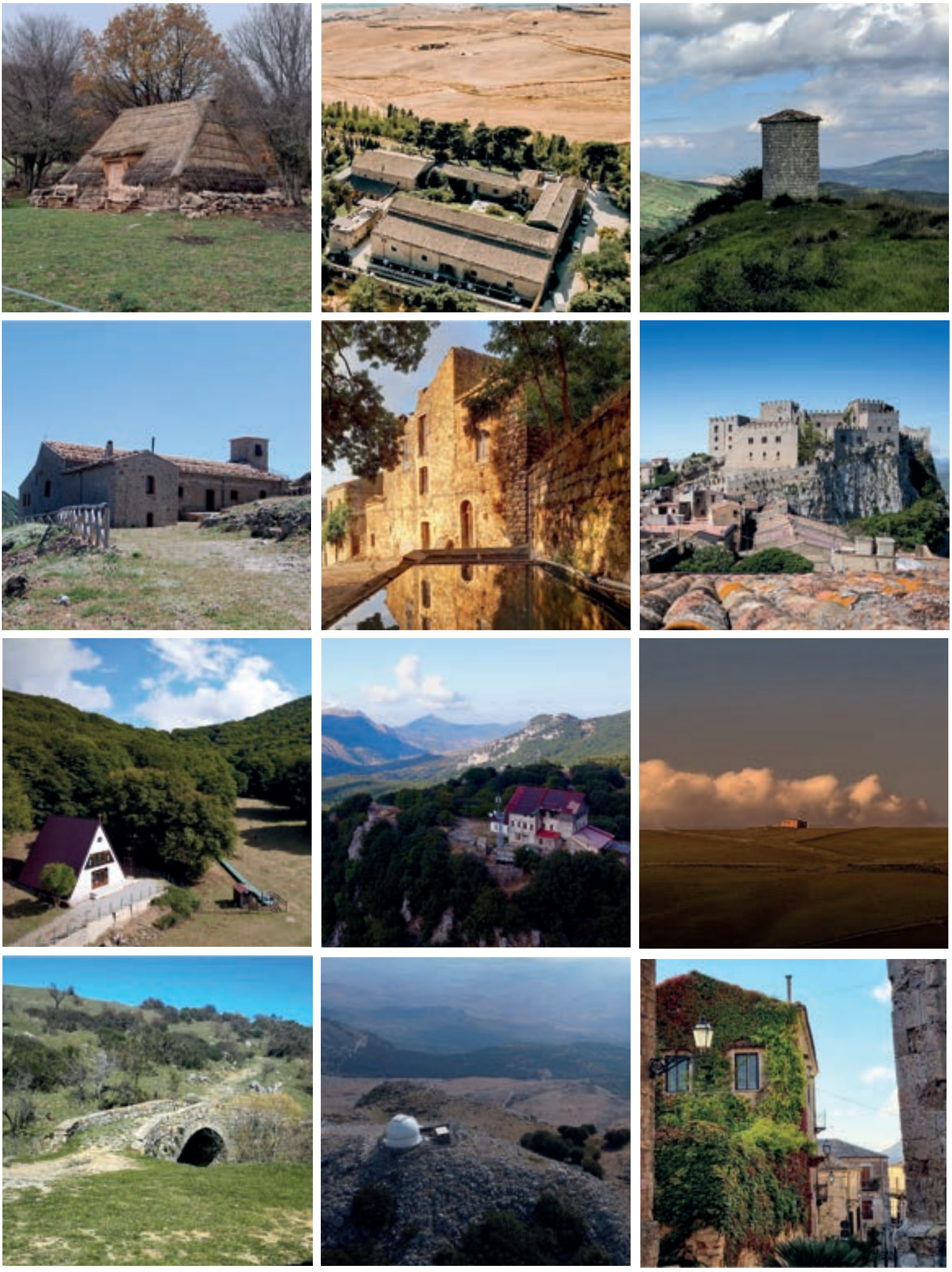


Fig. II.1.4.4 | Beni isolati ed edilizia rurale delle Madonie ©Luisa Lombardo, 2024

II.2 Analisi SWOT del comparto madonita

L'analisi di un territorio e delle sue dinamiche interne richiede l'impiego di una combinazione di metodi qualitativi e quantitativi, che offrono diverse prospettive per comprendere appieno le caratteristiche, le problematiche e le opportunità di un'area. I metodi quantitativi sono orientati alla raccolta e all'analisi di dati numerici, con l'obiettivo di misurare e descrivere fenomeni in modo oggettivo. Questi metodi forniscono informazioni statistiche precise e replicabili, fondamentali per prendere decisioni basate su evidenze concrete. Queste informazioni sono utili per mappare la struttura demografica e identificare le esigenze della popolazione, nonché conoscere il potenziale inespresso.

Sondaggi e questionari strutturati, invece, sono strumenti utilizzati per raccogliere dati su opinioni, comportamenti e preferenze della popolazione. Le domande a risposta chiusa consentono di raccogliere dati numerici facilmente analizzabili e comparabili. Infine, gli indicatori socio-economici, come il tasso di disoccupazione, il reddito medio, l'accesso ai servizi pubblici e l'efficienza dei trasporti, forniscono una valutazione oggettiva del benessere della popolazione e delle disuguaglianze nel territorio; questi possono essere consultati grazie alla banca dati fornita dall'ISTAT.

Al contrario, i metodi qualitativi si concentrano sulla comprensione delle esperienze, delle percezioni e delle dinamiche sociali, raccogliendo dati non numerici che offrono una visione più profonda e soggettiva del territorio. Le interviste individuali semi-strutturate o non strutturate permettono di esplorare in dettaglio opinioni, esperienze personali, valori e percezioni dei residenti. Questi metodi forniscono informazioni approfondite che non possono essere facilmente misurate con numeri. I *focus group*, che prevedono discussioni di gruppo facilitate, consentono di raccogliere opinioni collettive su temi specifici, stimolando il confronto tra diverse prospettive e aumentando la comprensione dei problemi e delle opportunità.

L'osservazione partecipante è un altro metodo qualitativo che consiste nell'osservare direttamente le dinamiche di una comunità, interagendo con i residenti e comprendendo le loro abitudini, comportamenti e interazioni quotidiane. Questo approccio aiuta a cogliere le relazioni sociali e culturali che caratterizzano un territorio. Le storie orali e i racconti sono un altro strumento utile per documentare esperienze vissute e comprendere come le persone percepiscono il loro ambiente, i cambiamenti nel tempo e le sfide che affrontano.

L'integrazione dei metodi qualitativi e quantitativi consente di ottenere una comprensione più completa del territorio. Un approccio misto, come in questo caso, permette di triangolare i dati, per esempio attraverso la combinazione dei risultati di un sondaggio con le risposte e le storie raccolte tramite interviste, creando una visione più sfumata delle dinamiche territoriali e sociali. Questo è quanto è stato fatto nei territori al fine di avere un quadro quanto più esaustivo delle dinamiche intraprese e presenti nel Parco delle Madonie e dei suoi 21 comuni.

L'analisi SWOT è stata privilegiata in quanto risponde all'esigenza di razionalizzazione dei processi decisionali, ecco perchè nel presente eleborato di tesi è stata presa come punto di riferimento per affrontare le problematiche

legate ai centri minori dell'Area del Parco delle Madonie.

Sviluppata più di 50 anni fa come supporto alla definizione di strategie aziendali in contesti caratterizzati da incertezza e forte competitività, a partire dagli anni '80, è stata utilizzata per scelte di intervento pubblico ed analizzare scenari alternativi di sviluppo. Oggi, l'uso di questa tecnica è stato esteso alle diagnosi territoriali e alla valutazione dei programmi regionali, anche regolamenti comunitari, oggi, inoltre, ne richiedono l'utilizzo per la valutazione di piani e programmi; maggiormente utilizzata e impiegata nell'ambito urbanistico, ma che, tuttavia, rappresenta un metodo efficace per la comprensione delle dinamiche territoriali.

Viene condotta sui punti di forza[1] (*Strenghts*), debolezze (*Weaknesses*), opportunità (*Opportunities*) e minacce (*Threats*) di un contesto territoriale specifico[1]; i primi due sono propri del contesto di analisi e sono modificabili grazie alla politica o all'intervento proposto. Le opportunità e le minacce, invece, derivano dal contesto esterno e non sono quindi modificabili.

Un'analisi ragionata del contesto territoriale in cui si realizza un programma di intervento permette di definire le opportunità di sviluppo di un settore o ambito di intervento. Serve ad evidenziare i principali fattori, interni ed esterni al contesto di analisi, in grado di influenzare il successo di un programma/piano; in particolare: consente di analizzare scenari alternativi di sviluppo; supporta l'impostazione di una strategia coerente rispetto al contesto su cui si interviene e consente di identificare le principali linee guida strategiche in relazione ad un obiettivo globale di sviluppo economico o settoriale.

Il suo utilizzo è raccomandato soprattutto in fase *ex ante* per migliorare l'integrazione del programma nel suo contesto; in fase intermedia consente di verificare se, in relazione ai cambiamenti intervenuti nel contesto, le linee di azione individuate siano ancora pertinenti e fornisce, inoltre, uno strumento per decidere modifiche al programma; *ex post* serve a contestualizzare i risultati finali dei piani e programmi;

Le modalità con cui può essere effettuata sono plurime e, ciascuna di esse, è utile ai fini dell'analisi territoriale:

- a **tavolino** (detta anche *desktop*): i punti di forza, debolezza, e le opportunità e minacce vengono determinati dal ricercatore sulla base dei dati di contesto e la previsione degli scenari si basa su "saperi esperti" neutrali ed oggettivi;
- con **lavori di gruppo** (definita "partecipata"): i punti di forza, debolezza, e le opportunità e minacce vengono messi a fuoco mediante l'uso di tecniche partecipate e la previsione di scenari condivisi si basa sull'analisi congiunta tra esperti e *stakeholders* dei dati di contesto.

L'analisi raccoglie in una matrice gli elementi critici di un intervento e del territorio in cui viene realizzato; tale matrice è, poi, organizzata in quattro sezioni che raccolgono le caratteristiche identificate come punti di forza, punti di debolezza, opportunità e minacce e si riferisce:

- al territorio oggetto di intervento;
- al settore interessato e/o ai singoli comparti;
- agli assi prioritari in cui si articola un programma.

Viene realizzata in sei fasi: nella prima viene fatta la ricognizione del contesto territoriale in cui viene realizzato il programma (costruzione di indicatori socio-demografici ed economici) e identificazione dei principali trend e problematiche; nella seconda, invece, viene fatta l'identificazione delle possibili azioni in relazione alle principali problematiche evidenziate.

Nella terza fase si occupa dell'analisi del contesto esterno e dell'identificazione delle opportunità e delle minacce; infine, nella quarta fase, viene effettuata l'analisi del contesto del programma e l'identificazione dei fattori, anche solo parzialmente sotto il controllo del gestore del programma, che possono agevolare o ostacolare lo sviluppo dell'area.

La quinta fase, invece, si occupa della classificazione/selezione delle possibili azioni in base alla loro rilevanza ossia: identificazione di quelle azioni (linee guida strategiche) che, facendo leva sui punti di forza, tentando di

[1] Nello specifico, i punti di forza sono gli aspetti positivi dell'organizzazione o del progetto che possono essere sfruttati per raggiungere gli obiettivi e le debolezze gli aspetti negativi dell'organizzazione o del progetto che possono ostacolare il raggiungimento degli obiettivi; Le opportunità sono gli eventi o le tendenze favorevoli che possono essere sfruttati per raggiungere gli obiettivi, mentre le minacce quegli eventi o tendenze sfavorevoli che possono ostacolare il raggiungimento degli obiettivi.

THEMES OF SWOT ANALYSIS

VIABILITÀ INFRASTRUTTURE VIARIE

Strade
Lunghezza totale della rete stradale (km)
Tipologia di strade (statali, provinciali, comunali)
Condizioni del manto stradale
Presenza di piste ciclabili e pedonali

Trasporto pubblico
Presenza di servizi di autobus, treno, tram
Frequenza e orari delle corse
Costi dei biglietti

STRUTTURE RICETTIVE

Numero di alberghi, agriturismi, B&B, case vacanze
Capacità ricettiva (numero di posti letto)
Tassi di occupazione media
Tipologia di clientela (italiana, straniera)

ASPETTI DEMOGRAFICI

Popolazione residente (totale, maschi, femmine)
Età media della popolazione
Tassi di natalità e mortalità
Saldo migratorio (immigrati e emigrati)
Numero di stranieri residenti

STILI DI VITA

Reddito medio pro capite
Tasso di occupazione
Livello di istruzione
Spesa media per consumi
Accesso a internet e servizi digitali

ASPETTI ECONOMICI

Presenza di attività economiche (agricoltura, industria, turismo)
Numero di aziende e addetti
Pil pro capite
Tasso di disoccupazione
Settori economici trainanti

CULTURA E TRADIZIONI

Numero di musei, biblioteche, siti archeologici
Eventi culturali e tradizionali
Associazioni culturali e di volontariato
Presenza di beni immateriali (UNESCO)

TECNOLOGIA

Diffusione di internet e banda larga
Utilizzo di smartphone e computer
E-government (servizi online della pubblica amministrazione)
Presenza di aziende ICT

LINGUA

Lingua madre della popolazione
Diffusione del dialetto siciliano
Conoscenza di lingue straniere

SICUREZZA

Tassi di criminalità (reati contro la persona e il patrimonio)
Presenza di forze dell'ordine
Percezione della sicurezza da parte dei cittadini

PAESAGGIO

Superficie territoriale (kmq)
Altitudine
Tipologia di paesaggio (montagna, collina, pianura)
Presenza di aree protette

TERRITORIO

Uso del suolo (agricolo, forestale, urbano)
Risorse idriche
Rischio idrogeologico
Qualità dell'aria

LOGISTICA

Distanza
Altimetria

EDILIZIA

Immobili in uso
Immobili in disuso

Fig. II.2.1 | Articolazione della SWOT Analysis. ©2023, Luisa Lombardo

ridurre quelli di debolezza massimizzando le opportunità e minimizzando le minacce, siano maggiormente in grado di ridurre i problemi di sviluppo; nell'ultima e sesta fase, infine, serve per giudicare la rilevanza di una strategia già attuata o pianificata (in particolare viene effettuata la verifica della rilevanza degli interventi rispetto agli elementi di contesto);
I **vantaggi** dell'analisi SWOT sono l'analisi approfondita del contesto orienta nella definizione delle strategie; la verifica di corrispondenza tra strategia e fabbisogni consente di migliorare l'efficacia; consente di raggiungere un consenso sulle strategie (se partecipano all'analisi tutte le parti coinvolte dall'intervento) e la flessibilità.
Gli **svantaggi**, invece, rischio di procedure soggettive da parte del team di valutazione nella selezione delle azioni; può descrivere la realtà in maniera troppo semplicistica e se non viene attuata in un contesto di partnership esiste il rischio di scollamento tra piano scientifico e politico pragmatico.

A livello locale, e dunque, per l'area del Parco delle Madonie, e per l'analisi SWOT, sono stati presi in considerazione non solo i comuni identificati dalla Strategia Nazionale per le Aree Interne (SNAI) (*Fig. 1*), ma anche i comuni che, dalla stessa strategia, sono identificati come le Aree gravitazionali strategiche per l'Ambito SNAI, ed in particolare i seguenti comuni: Alimena, Blufi, Bompietro, Castellana Sicula, Gangi, Geraci Siculo, Petralia Soprana, Petralia Sottana, Polizzi Generosa, Castelbuono, Collesano, Gratteri, Isnello, Pollina, San Mauro Castelverde, Aliminusa, Caccamo, Caltavuturo, Scillato, Sclafani Bagni, e in più altri 10 limitrofi tra cui Montemaggiore Belsito, Scillato, Sclafani Bagni, Termini Imerese, Sciara, Cerda, Campofelice di Roccella, Lascari, Cefalù e Valledolmo.

II.2.1 Disamina dei dati demografici, economici, sociali, culturali, geografici e ambientali

Per l'area oggetto di studio (ovvero il Parco delle Madonie) l'analisi esaustiva degli elementi caratteristici del territorio si è articolata secondo il seguente schema fornito in *Fig. 1* Ciascun tematismo è stato approfondito prendendo in esame i dati relativi ai singoli comuni e il dato medio relativo dalle fonti ISTAT. Di seguito l'analisi approfondita di ogni tematismo:

VIABILITÀ - INFRASTRUTTURE VIARIE

Per un'analisi completa della viabilità nel comparto delle Madonie, è necessario considerare diversi elementi chiave, come le strutture viarie, la tipologia di strade, le condizioni del manto stradale, le piste ciclabili, il traffico veicolare e il trasporto pubblico. Esaminare le strutture viarie è fondamentale per comprendere l'accessibilità e la connessione tra i diversi comuni e le aree rurali della regione. La tipologia di strade, che include strade principali, secondarie e rurali, offre indicazioni sulla capacità della rete di supportare il flusso di traffico e di collegare efficacemente le comunità locali.

Le condizioni del manto stradale rappresentano un fattore critico per la sicurezza e la qualità della circolazione. Strade in cattivo stato possono non solo aumentare il rischio di incidenti, ma anche ridurre la velocità media dei trasporti, influendo negativamente sulla mobilità e sull'economia locale. Le piste ciclabili, se presenti, sono un indicatore della sostenibilità della viabilità e del grado di attenzione alle esigenze dei ciclisti e degli amanti della mobilità dolce. La presenza e la qualità di queste infrastrutture possono incentivare l'uso della bicicletta, riducendo il traffico veicolare e contribuendo al miglioramento della qualità dell'aria.

Il traffico veicolare è un aspetto che influenza direttamente la qualità della vita degli abitanti, in particolare nelle aree più urbanizzate. Una gestione efficace del traffico può ridurre i tempi di percorrenza e le emissioni inquinanti, mentre un traffico congestionato può avere l'effetto opposto. Infine, il trasporto pubblico riveste un ruolo cruciale nella mobilità locale. Valutare l'efficienza del trasporto pubblico, considerando gli orari e i costi dei biglietti, ad esempio quelli delle corse dal paese di riferimento a Palermo e viceversa, è essenziale per comprendere quanto sia accessibile e fruibile da

parte della popolazione. Un servizio di trasporto pubblico ben organizzato e a prezzi accessibili può ridurre la dipendenza dall'auto privata, migliorando l'inclusività e la sostenibilità del sistema di viabilità.

Analizzare questi fattori permette di comprendere le sfide e le opportunità legate alla viabilità nelle Madonie, fornendo una base solida per lo sviluppo di strategie che migliorino la mobilità, la sicurezza e la qualità della vita nel territorio.

A partire da queste premesse, l'analisi SWOT del contesto madonita si è svolta a partire dall'analisi di un contesto ben più vasto, ovvero rapportandosi al contesto nazionale, e dunque italiano, dando una rilevanza in prima battuta ai collegamenti e ai trasporti dell'area rispetto al contesto in cui si colloca, l'Italia. In particolare, si analizzeranno i seguenti trasporti: marittimo, aereo, ferrato e carrabile, sia privato che pubblico.

Il Porto di Termini Imerese è, inoltre, un importante punto di collegamento tra la Sicilia e il resto d'Italia, centro di traffico marittimo, sia per il trasporto di merci che per il trasporto di passeggeri. Oggi è anche un importante centro turistico, grazie alla sua posizione strategica che risulta essere baricentrica rispetto all'Isola e ha una discreta distanza dai porti e dagli aeroporti più importanti presenti nell'isola come Palermo, Catania e Trapani. Questo lo rende meno lontano dei servizi essenziali e la possibilità di interagire con il resto dell'isola. Riguardo il trasporto marittimo, è collegato al resto d'Italia tramite una serie di servizi, tra cui:

- **aereo:** l'Aeroporto di Palermo, situato a circa 30 km dal porto dell'omonima città, è servito da una serie di compagnie aeree che collegano la Sicilia con le principali città italiane e internazionali, tuttavia per raggiungerlo occorrono dai 50 minuti a 1 ora e mezza;
- **treno:** la stazione ferroviaria di Termini Imerese è servita da una serie di treni che collegano la città con alcune delle principali città siciliane. Alcune fermate come Cefalù, Lascari, Montemaggiore Belsito di approdo al comparto madonita;
- **autobus:** il porto è servito da una serie di linee di autobus che collegano la città con le principali città siciliane seppur in orari specifici e con corse non frequenti durante la giornata;
- **auto:** il porto è collegato alla rete autostradale italiana tramite la A19 Palermo-Catania; tutti gli altri comuni hanno SS e SP;
- **traghetti:** il porto è collegato a diverse città italiane, tra cui Palermo, Catania, Napoli, Genova, Livorno, Civitavecchia e Savona;
- **crociere:** il porto è un importante scalo per le crociere, che partono e arrivano da diverse destinazioni italiane e internazionali anche se il porto principale rimane quello di Palermo.

Ulteriori analisi hanno riguardato la distanza di percorrenza dei comuni appartenenti al comprensorio rispetto al capoluogo di provincia, e di regione. La distanza di percorrenza varia dai 30 minuti fino ad un massimo di 2 ore, come da *Fig. 2*. Questa distanza ha, nel corso degli anni suggerito una divisione dell'area delle Madonie rispettivamente in Aree ultraperiferiche, periferiche e intermedie.

Dall'analisi effettuata emerge che, nonostante i centri delle Madonie siano attualmente costituiti da località per lo più periferiche, risultano comunque serviti dai centri situati nelle vicinanze col resto d'Italia si fa riferimento principalmente a Palermo o Enna. È altresì vero che la regione dispone di limitate infrastrutture autostradali, fatta eccezione per l'arteria principale rappresentata dall'A19. Tuttavia, mediante l'utilizzo di mezzi di trasporto alternativi, come autobus o mezzi privati, è possibile raggiungere i nodi strategici dei vari collegamenti con le città circostanti e con gli aeroporti regionali seppur con dovute limitazioni. Adesso si andranno ad analizzare nel dettaglio i collegamenti tra i comuni coinvolti.

STRADE

Lunghezza della rete stradale

La lunghezza media della rete stradale nei comuni siciliani oggetto di studio si attesta a circa 47 km. Tra i comuni analizzati, spiccano per estensione Termini Imerese (112,8 km), Collesano (78,5 km) e Castelbuono (64,2 km), mentre si registrano dimensioni più contenute per Sciara (27,3 km), Campofelice di Roccella (32,9 km) e Lascari (25,4 km), più vicine al capoluogo.

È possibile osservare una correlazione significativa tra la lunghezza della rete stradale e la dimensione della popolazione del comune: i centri abitati di maggiori dimensioni tendono ad avere una rete stradale più estesa. Effettuando un confronto con i dati nazionali, emerge che la lunghezza media della rete stradale nei comuni italiani è di circa 55 km. In generale, la rete stradale dei comuni siciliani madonita risulta leggermente meno estesa rispetto a quella dei comuni italiani in generale. La lunghezza della rete stradale costituisce un indicatore cruciale per la valutazione della mobilità e dell'accessibilità di un comune. In linea di massima il dato accerta l'inaccessibilità dei comuni minori e in posizione ultraperiferica.

Tale parametro varia in relazione a diversi fattori, tra cui la dimensione della popolazione, l'estensione territoriale, la conformazione orografica e la presenza di attività economiche. I dati relativi alla lunghezza della rete stradale sono utili nell'ambito della pianificazione di interventi mirati alla manutenzione e allo sviluppo infrastrutturale, contribuendo così a migliorare l'efficienza del sistema viario e la qualità complessiva della mobilità urbana tra comuni.

Tipologia della Infrastruttura viaria **(statali, provinciali e comunali)**

La rete stradale nei comuni siciliani oggetto di studio risulta prevalentemente composta da strade statali (SS) e strade provinciali (SP). La presenza di autostrade è circoscritta ad alcuni comuni specifici, tra cui si annoverano Termini Imerese e Cefalù nella A19.

La maggior parte dei centri abitati dispone di una rete stradale comunale ben strutturata, assicurando un adeguato collegamento alle principali aree urbane e rurali.

Effettuando un confronto con i dati nazionali, si osserva una distribuzione simile tra strade statali, provinciali e comunali nei comuni siciliani rispetto al resto d'Italia. Tuttavia, è importante sottolineare che la rete autostradale in Sicilia risulta molto meno estesa rispetto ad altre regioni del nord Italia.

Questo scenario riflette una specifica caratteristica infrastrutturale della regione siciliana, evidenziando la preponderanza delle vie statali e provinciali nel tessuto viario locale. La presenza limitata di autostrade, riscontrabile solo in alcune località, influenza la mobilità e la connettività regionale, aspetti che meritano attenzione nella valutazione dei requisiti infrastrutturali e nella pianificazione di eventuali interventi mirati.

Non risulta un caso che i paesi delle Madonie, il più delle volte, risultino poco accessibili e che, secondo quanto già presentato nel Capitolo I, l'investimento maggiore dei piccoli comuni in seno agli interventi della SNAI, ma anche del PNRR risulti proprio relativo al miglioramento di queste.

La condizione di marginalità è infatti dovuta, oltre che da un decentramento rispetto ai poli di riferimento, anche da un manto stradale poco praticabile che limita gli spostamenti possibili nell'area.

Condizioni del manto stradale

La situazione del manto stradale nei comuni siciliani oggetto di analisi si presenta in modo discreto, caratterizzata da alcune zone in buone condizioni e altre, invece, affette da buche e avvallamenti. Tale variabilità nella condizione del manto stradale può essere attribuita a diversi fattori, tra cui la mancanza di interventi di manutenzione, le avverse condizioni atmosferiche, talvolta caratterizzate dalla presenza della neve, e l'incidenza del traffico veicolare intenso.

Risulta evidente che i comuni che presentano una condizione del manto stradale più favorevole sono quelli che hanno recentemente effettuato lavori

di manutenzione e che hanno ricevuto fondi dai recenti bandi messi a disposizione dei piccoli comuni, come il PNRR.

Effettuando un confronto con i dati nazionali, emerge una situazione analoga per la Sicilia rispetto al resto d'Italia, con la presenza diffusa di buche e avvallamenti su varie strade. Le regioni del nord Italia si distinguono per una rete stradale in condizioni superiori, beneficiando di una maggiore attenzione alla manutenzione e di investimenti più consistenti. Questo confronto evidenzia la necessità di implementare strategie mirate per il miglioramento delle condizioni del manto stradale in Sicilia e sulle Madonie, al fine di garantire una maggiore sicurezza e efficienza nella circolazione veicolare. La priorità all'implementazione di interventi di manutenzione, unitamente a un attento monitoraggio delle condizioni stradali, potrebbe contribuire a mitigare gli effetti negativi derivanti dalla variabilità attuale e a promuovere un ambiente viario più sostenibile.

Piste ciclabili

Le piste ciclabili esistenti nel comprensorio sono attualmente limitate a soli due comuni, Termini Imerese e Cefalù, con una lunghezza complessiva di circa 7 km.

Allo stesso tempo, si registra un impegno verso la promozione della mobilità sostenibile con la pianificazione o la realizzazione di nuove piste ciclabili in quattro comuni: Castelbuono, Gangi, Petralia Sottana e Polizzi Generosa, insieme a quella realizzata da Geraci Siculo[1] nel lontano 2022.

La maggioranza dei comuni (24 su 27) non dispone attualmente di piste ciclabili, evidenziando una carenza significativa nonostante le occasioni di vedere ciclisti non siano così rade. Molti, infatti, sfruttano la Strada Statale per fare attività fisica.

Questa lacuna impedisce la fruizione di spostamenti in bicicletta in maniera sicura e confortevole, limitando le opzioni di mobilità sostenibile.

La realizzazione di nuove piste ciclabili rappresenta un passo cruciale per incentivare la mobilità sostenibile e favorire lo sviluppo del cicloturismo in Sicilia. Tuttavia, è fondamentale che i progetti relativi siano accuratamente pianificati e attuati al fine di garantire la sicurezza dei ciclisti e promuovere un utilizzo efficace di tali infrastrutture. Tale iniziativa potrebbe contribuire significativamente a migliorare la qualità della mobilità urbana e a promuovere uno stile di vita più sano e sostenibile. Non è, inoltre, facile la loro implementazione a causa delle altimetrie presenti che non agevolano e garantiscono un percorso fluido. Anche le strade molto strette non sempre sono accoglienti rispetto all'idea di inserire nuovi percorsi.

Traffico veicolare

L'Istituto Nazionale di Statistica (ISTAT) annualmente pubblica un dettagliato report sugli incidenti stradali in Italia, fornendo dati disaggregati per regione, provincia e comune. Analizzando il report "Incidenti stradali in Sicilia", emergono i seguenti dati:

- numero di incidenti: Il comune con il maggior numero di incidenti risulta essere Termini Imerese, registrando 144 incidenti, seguito da Cefalù con 84 e Caccamo con 67. Al contempo, Alimena, Blufi, Bompietro e Sclafani Bagni presentano il minor numero di incidenti, pari a 2 ciascuno;
- numero di feriti: Termini Imerese è il comune che riporta il maggior numero di feriti, con 187 casi, seguito da Cefalù con 105 e Caccamo con 84. Alimena, Blufi, Bompietro e Sclafani Bagni risultano i comuni con il minor numero di feriti, con 2 casi ciascuno;
- numero di morti: Cinque comuni (Alimena, Blufi, Bompietro, Castellana Sicula e Sclafani Bagni) non hanno registrato alcuna vittima per incidenti stradali nel 2022. Termini Imerese si posiziona al vertice della classifica con 5 morti, seguito da Caccamo con 3 e Cefalù, Gangi e Petralia Sottana, ognuno con 2 vittime.

Questo si evince dalla non presenza di strade a scorrimento veloce nel com-

[1] Geraci Siculo si arricchisce di una pista per mountain bike, situata in contrada Fegotti nel Parco delle Madonie, grazie a un protocollo d'intesa tra il Comune e il Dipartimento regionale sviluppo rurale dell'Assessorato all'Agricoltura. L'iniziativa, operativa da giugno 2022, mira a promuovere il turismo esperienziale e sportivo, incentivare la rigenerazione territoriale e contrastare lo spopolamento. I lavori comprendono la sistemazione del sentiero e l'installazione di segnaletica dedicata. Il sindaco Luigi Iuppa sottolinea l'importanza di offrire attrazioni capaci di valorizzare i piccoli borghi, permettendo ai visitatori di godere delle bellezze incontaminate delle Madonie (Balarm, 4 maggio 2022)

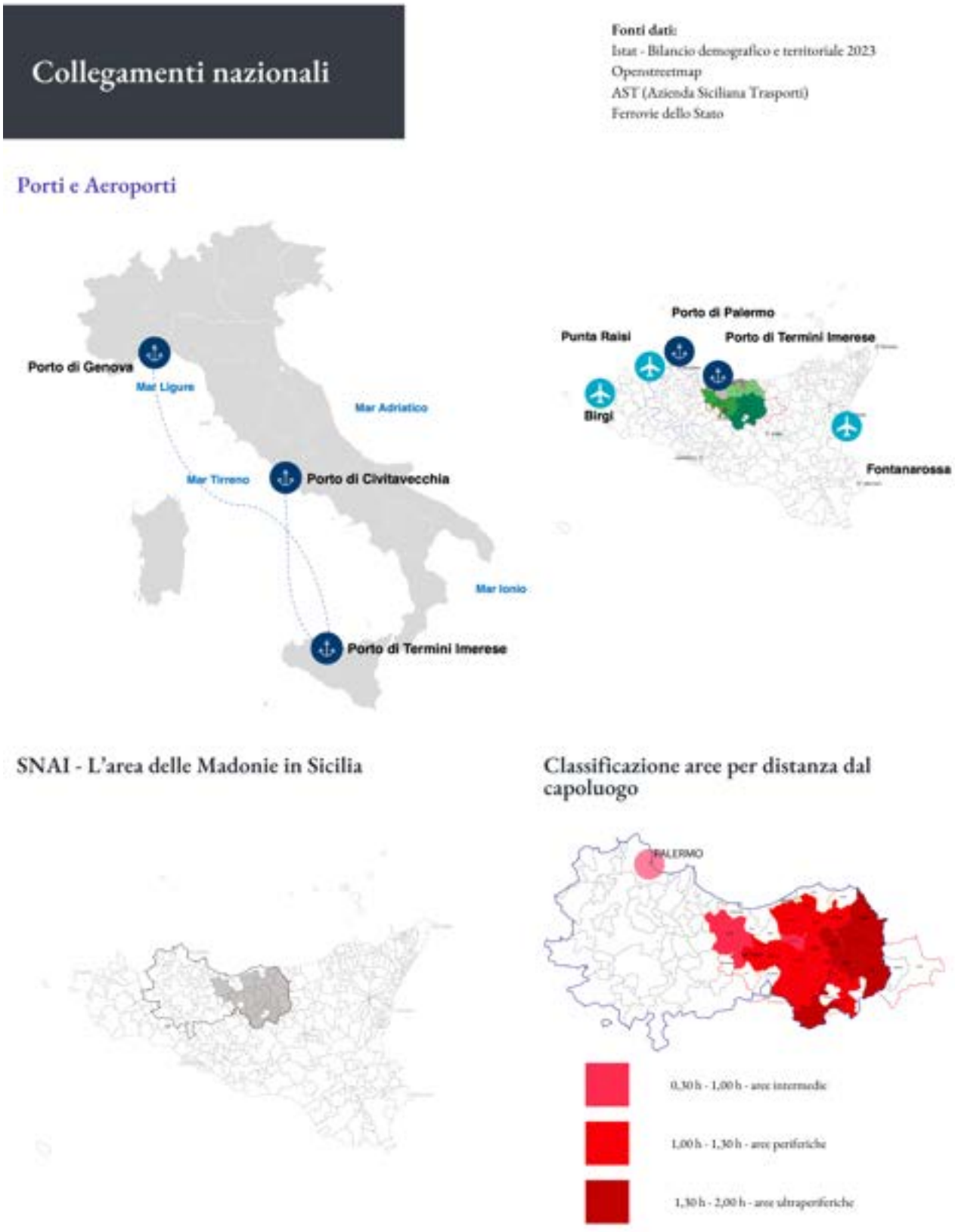


Fig. II.2.2 | SWOT Analysis - Collegamenti nazionali ©2023, Luisa Lombardo

Viabilità o infrastrutture viarie

Fonti dati:
Istat - Bilancio demografico e territoriale 2023
Openstreetmap
AST (Azienda Siciliana Trasporti)
Ferrovie dello Stato

Strade	LUNGHEZZA RETE STRADALE	≅47 Km
	TIPOLOGIE DI STRADE	SS e SP
	CONDIZIONI DEL MANTO STRADALE	Discreta/Cattiva
	PRESENZE DI PISTE CICLABILI O PEDONALI	3/27
	TRAFFICO VEICOLARE	+ Termini Imerese - Sclafani Bagni
Trasporto pubblico	AUTOBUS, TRENO E TRAM	
	FREQUENZA E ORARI DELLE CORSE	+ Comuni più grandi e in alta stagione
	COSTO BIGLIETTI	€ 2,00 - 15,00

Fig. II.2.3 | SWOT Analysis - Viabilità e Infrastrutture viarie. ©2023, Luisa Lombardo

prensorio e dalla non possibilità di percorrere i centri dei piccoli comuni con facilità.

TRASPORTO PUBBLICO

Presenza di autobus, treno e tram

La copertura dei servizi di autobus appare capillare, con tutti i comuni indicati che risultano beneficiarne. Al contrario, la rete ferroviaria presenta una distribuzione più limitata, servendo solo alcuni comuni attraverso stazioni ferroviarie vicino al mare. È da notare che nessuno dei comuni considerati dispone di collegamenti tramviari.

- zone Interne: Le località montane e delle zone interne sono prevalentemente servite esclusivamente da autobus, con una potenziale riduzione della frequenza dei collegamenti rispetto alle aree costiere. Le poche linee presente effettuano solo una o massimo due partenze al giorno per il capoluogo di Provincia, ma anche per le altre città limitrofe;
- zone Costiere: I comuni costieri godono generalmente di servizi sia autobus che treni, con una frequenza dei collegamenti che tende ad essere superiore rispetto alle zone interne. Tra questi si menziona Cefalù che, poichè risulta essere una meta balneare molto gettonata, ha un'assidua presenza di corse durante tutta la settimana, ancora maggiore durante il periodo estivo.

La diffusione dei servizi di trasporto pubblico assume una rilevanza cruciale per la mobilità dei cittadini e per lo sviluppo economico delle aree rurali. L'evidente divario di accessibilità tra le zone interne e costiere costituisce una problematica da affrontare per garantire pari opportunità a tutti i cittadini.

La situazione del trasporto pubblico in Sicilia presenta aspetti positivi, con una diffusa presenza di autobus che garantisce una certa accessibilità. Tuttavia, la rete ferroviaria limitata e la frequenza dei collegamenti insufficiente in alcune zone rappresentano criticità che limitano l'accessibilità territoriale. Per superare tali sfide, sono necessari investimenti mirati e una pianificazione strategica che mirino a migliorare la mobilità e la qualità della vita nell'intera regione siciliana.

Frequenza e orari delle corse

La frequenza delle corse dei mezzi di trasporto pubblico mostra una variazione in relazione al comune di riferimento e al periodo dell'anno.

In linea generale, si osserva che le corse sono più frequenti nei centri urbani di dimensioni maggiori e durante il periodo di alta stagione, nei mesi di luglio e agosto.

Nei comuni di dimensioni più ridotte, invece, è possibile che la frequenza delle corse sia limitata a poche al giorno. Talvolta una al giorno o in soli due orari giornalieri lasciando scoperte anche le fascie più utili o le prime ore del mattino per andare a lavoro o a scuola o semplicemente per tornare a casa. Tale disparità nella disponibilità dei servizi di trasporto pubblico riflette la dinamica della domanda e dell'offerta, influenzata dalla dimensione della comunità e dalla stagionalità delle attività.

Costo dei biglietti

Il costo dei biglietti per il trasporto pubblico varia in base al mezzo di trasporto impiegato, alla distanza percorsa e alla compagnia di trasporto selezionata.

- autobus: I biglietti degli autobus da Palermo per i comuni indicati presentano una variazione di prezzo compresa tra € 2,50 e € 10,00 circa. La tariffa è comunemente calcolata in relazione alla distanza percorsa, offrendo opzioni di acquisto per corse singole, giornaliere o settimanali. Alcune compagnie di autobus concedono sconti per categorie specifiche di utenti, tra cui studenti, anziani e persone con disabilità.
- treno: Per quanto riguarda i treni da Palermo verso solo alcuni comuni costieri elencati, i costi dei biglietti oscillano tra € 4,00 e € 15,00 circa. La tariffa è generalmente determinata in base alla distanza percorsa e al

tipo di treno utilizzato. Sono disponibili diverse opzioni di acquisto, tra cui biglietti per corse singole, andata e ritorno, e abbonamenti mensili o annuali. Trenitalia offre inoltre agevolazioni tariffarie per studenti, anziani e persone con disabilità.

Complessivamente, i costi dei biglietti del trasporto pubblico da Palermo verso i comuni indicati variano da € 2,00 a € 10,00 circa.

Tale variazione è in parte determinata dalla distanza geografica dai comuni di destinazione, risultando generalmente più elevati per quelli situati a maggiore distanza e raggiungibili solo tramite il servizio ferroviario. I prezzi complessivi sono in linea con quelli praticati in altre regioni italiane.

Nei comuni delle zone interne, si riscontra una tendenza all'aumento dei costi dei biglietti, attribuibile principalmente alla maggiore distanza da Palermo e alla minore frequenza dei collegamenti. I comuni situati lungo le zone costiere presentano generalmente costi dei biglietti inferiori, attribuibili alla minor distanza da Palermo e alla maggiore frequenza dei collegamenti.

Strutture ricettive

Se è importante comprendere in che modo questi piccoli comuni si interfaccino con i poli di collegamento maggiore, è altresì importante capire lo stadio del processo di ricettività, ovvero quanto i comuni riescono a cogliere dal settore turistico nonostante le difficoltà di collegamento riscontrabili dall'analisi precedentemente effettuate.

Nello specificio, in questa sezione, si andranno ad analizzare il numero delle strutture ricettive[2] presenti, i tassi di occupazione derivanti, così come il tipo di clientela presente.

Numero di strutture ricettive in Sicilia

Fig. II.2.4 - SWOT Analysis - Strutture ricettive ©2023, Luisa Lombardo

L'incremento del numero di alberghi, agriturismi, bed and breakfast e case vacanze nei comuni siciliani riflette un costante aumento del turismo nella regione. Tuttavia, è importante sottolineare che la loro distribuzione non è uniforme, evidenziando una maggiore concentrazione nelle zone costiere, come nel caso di Cefalù[2,3] per il comparto madonita, e nelle città d'arte o, per meglio dire, li dove la presenza di itinerari artistici, così come di attività culturali è in aumento o è fortemente presente.

Nel complesso, le tipologie di strutture ricettive più diffuse comprendono alcuni alberghi, molti bed and breakfast e le moltissime case vacanze.

Le zone costiere presentano la maggiore concentrazione di strutture ricettive, in particolare alberghi e case vacanze. Tale fenomeno può essere attribuito alla presenza di spiagge, mare e paesaggi suggestivi, fattori che attirano numerosi visitatori nel periodo estivo, o anche per la facilità di collegamenti, in ultimo, è da considerarsi fondamentale la componente architettonica e lo stato di conservazione dell'architettura tradizionale. I così chiamati "borghi gioiello" come Cefalù o Castelbuono attirano annualmente tantissimi visitatori per le loro peculiarità oltre che culturali, anche storico-architettoniche.

Contrariamente alle zone costiere, le zone interne mostrano una minore densità di strutture ricettive e sono tantissime le seconde case adibite o in corso di trasformazione in case vacanze. É l'era del turismo lento o della volontà di condividere le abitudini dei piccoli centri assaporando odori, sapori e attività locali, nonché modi di vivere. Tuttavia, si sta sviluppando un turismo rurale che offre agli ospiti l'opportunità di immergersi nella natura e nelle tradizioni locali, contribuendo a una diversificazione dell'offerta turistica. Le città d'arte, come ad esempio Cefalù, vantano un'ampia offerta di strutture ricettive, in particolare alberghi e bed and breakfast, nonchè case vacanze. Questo fenomeno è legato alla presenza di monumenti, musei e altri luoghi di interesse storico e culturale, che attraggono un flusso continuo di turisti.

<u>Capacità ricettiva</u>

L'aumento della capacità ricettiva nei comuni siciliani riflette una crescita costante del turismo in questa regione.

È fondamentale notare che la distribuzione dei posti letto non è uniforme, con una maggiore concentrazione nelle zone costiere. In generale, le tipologie di strutture ricettive con la maggiore capacità ricettiva includono gli alberghi (scarsamente presenti nelle aree montane e, una volta, vecchi rifugi montani[3]), i bed and breakfast e le case vacanze.

Le zone costiere mostrano, dunque, la maggiore capacità ricettiva, soprattutto per quanto riguarda alberghi e case vacanze. Questo fenomeno può essere attribuito alla presenza di spiagge, mare e paesaggi suggestivi, fattori che attraggono un considerevole flusso di turisti.

Al contrario, le zone interne presentano una minore capacità ricettiva. Tuttavia, si osserva uno sviluppo del turismo rurale che offre agli utenti l'opportunità di vivere un'esperienza a contatto con la natura e le tradizioni locali, contribuendo alla diversificazione dell'offerta turistica.

Cefalù, dispone di un'ampia offerta di posti letto, in particolare case vacanze, grandi alberghi come il Costa Verde o il Relais e bed and breakfast. Questa ricchezza è dovuta alla presenza di monumenti, musei e altri luoghi di interesse storico e culturale, che costituiscono un forte attrattore per i visitatori, nonchè festival e attività notturne per giovani e meno giovani.

<u>Tassi di occupazione media</u>

I dati relativi al tasso di occupazione delle strutture ricettive nei comuni siciliani indicano una significativa variabilità, con valori che oscillano tra il 20% e il 60%. In linea generale, si registra una maggiore incidenza nei tassi di occupazione nelle zone costiere, come Termini Imerese e Cefalù, che beneficiano di una spiccata attrattiva turistica.

Nelle zone interne, i tassi di occupazione tendono ad essere inferiori, con

[2] Scent of Sicily. (2023). Cefalù: Guida turistica Sicilia. Retrieved August 9, 2024, from https://www.scent-of-sicily.it/guida-turistica-sicilia/cefalu/

[3] PalermoToday. (2024). La Montanina, il rifugio tra i boschi delle Madonie recuperato da Legambiente. Retrieved August 9, 2024, from https://www.palermotoday.it/cronaca/la-montanina-rifugio-orestano-piano-zucchi-legambiente.html

alcune eccezioni come Gangi e Castelbuono, che hanno saputo valorizzare efficacemente le proprie risorse turistiche. I dati evidenziano altresì una marcata stagionalità del turismo, con tassi di occupazione in notevole crescita durante l'alta stagione e cali nei periodi di bassa stagione.

Nei comuni costieri, quali Cefalù e Pollina, si osservano i tassi di occupazione più elevati, grazie alla presenza di spiagge, mare e paesaggi suggestivi, così come resort turistici e grande attenzione alla movida. La stagionalità del turismo è un fenomeno ben pronunciato in queste zone, con picchi di occupazione durante l'estate e una riduzione seppur inferiore nei periodi invernali.

I comuni delle zone interne, come Alimena e Bompietro, manifestano generalmente tassi di occupazione più contenuti, a volte anche scersi. Tuttavia, si sta assistendo a uno sviluppo del turismo rurale, offrendo agli utenti l'opportunità di immergersi nella natura e nelle tradizioni locali. La destagionalizzazione del turismo emerge come una sfida rilevante per queste aree.

<u>Tipologia di clientela</u> (italiana, straniera)
I dati sulla tipologia di clientela delle strutture ricettive nei comuni siciliani rivelano una netta prevalenza di turisti italiani, con alcune eccezioni come Cefalù e Pollina, attrattive per un notevole afflusso di stranieri, soprattutto francesi, tedeschi e inglesi.

Nelle zone costiere, la clientela straniera è più presente, soprattutto durante l'alta stagione. In contrasto, nelle zone interne, la clientela italiana risulta più consistente, con una predominante presenza di famiglie e persone in cerca di un turismo tranquillo e a stretto contatto con la natura.

ASPETTI DEMOGRAFICI

Gli ultimi dati ISTAT sullo spopolamento dei piccoli centri allarma l'area delle Madonie. Si attesta infatti una netta perdita di popolazione a partire già da prima della stagione della pandemia che ha registrato, tuttavia, un piccolo incremento dovuto alla possibilità di lavorare in *smart* e lontano da caos e dal contatto umano.

Nello specifico, nei paragrafi successivi, si andrà a delineare la presenza di popolazione presente[3], la sua età media, così come il flusso migratorio per comprendere le dinamiche territoriali utili a determinare le possibili strategie da intraprendere affinchè sia possibile lo sviluppo di *Smart Villages*.

<u>Popolazione residente</u> (totale, maschi, femmine)
La popolazione residente nei comuni siciliani evidenzia una tendenza al decremento, sebbene alcune eccezioni, come Campofelice di Roccella e Cefalù, centri nevralgici del turismo estivo per la grande presenza di presidi estivi per le vacanze, presentino un aumento demografico.

Questo declino è più accentuato nelle zone interne, seppur, a volte e per periodi presenti un ritorno consistente alla casa natia durante il periodo estivo e per la presenza di eventi locali che animano il territorio, mentre le zone costiere tendono ad essere più densamente popolate. Il divario di popolazione tra maschi e femmine risulta contenuto.

<u>Età media della popolazione</u>
L'età media della popolazione nei comuni siciliani supera la media nazionale, attestandosi a 45,4 anni. Si osserva una maggiore età media nelle zone interne, mentre le zone costiere presentano una popolazione mediamente più giovane. Il divario di età media tra i comuni è significativo.

<u>Tassi di natalità e mortalità</u>
I tassi di natalità nei comuni siciliani risultano inferiori alla media nazionale, fissata a 6,8 nati per mille abitanti. Al contrario, i tassi di mortalità si rivelano superiori alla media nazionale, raggiungendo i 10,6 morti per mille abitanti. Il divario tra i tassi di natalità e mortalità è significativo in alcuni comuni.

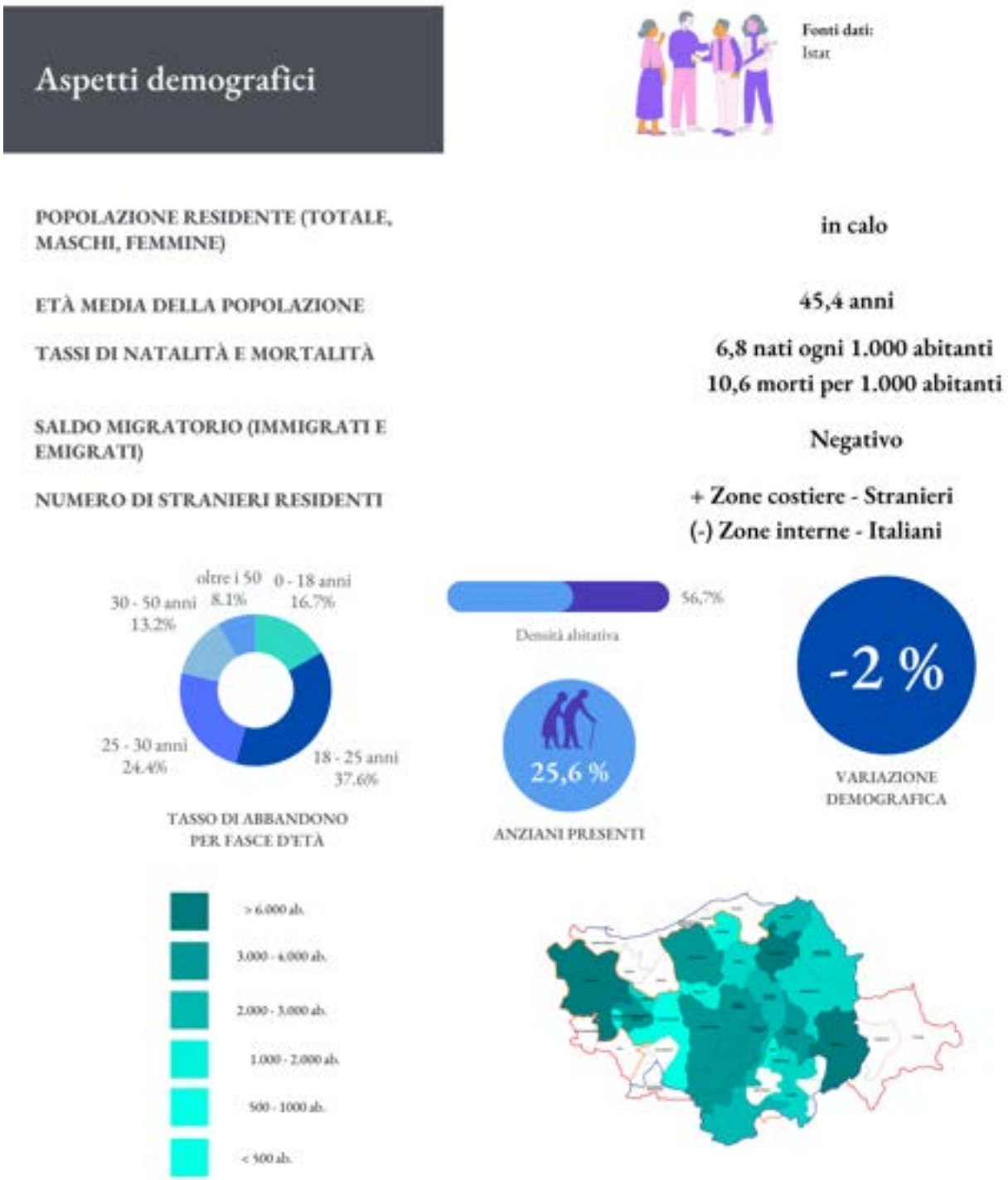
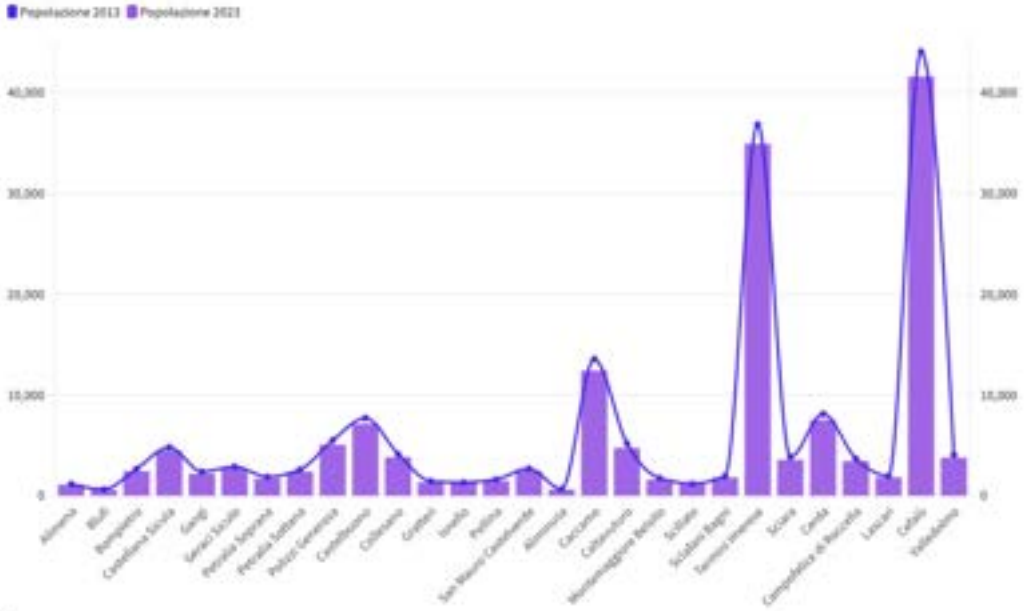


Fig. II.2.5 | SWOT Analysis - Aspetti demografici ©Luisa Lombardo, 2023

Aspetti demografici

Fonti dati:
Istat

POPOLAZIONE



DENSITÀ ABITATIVA

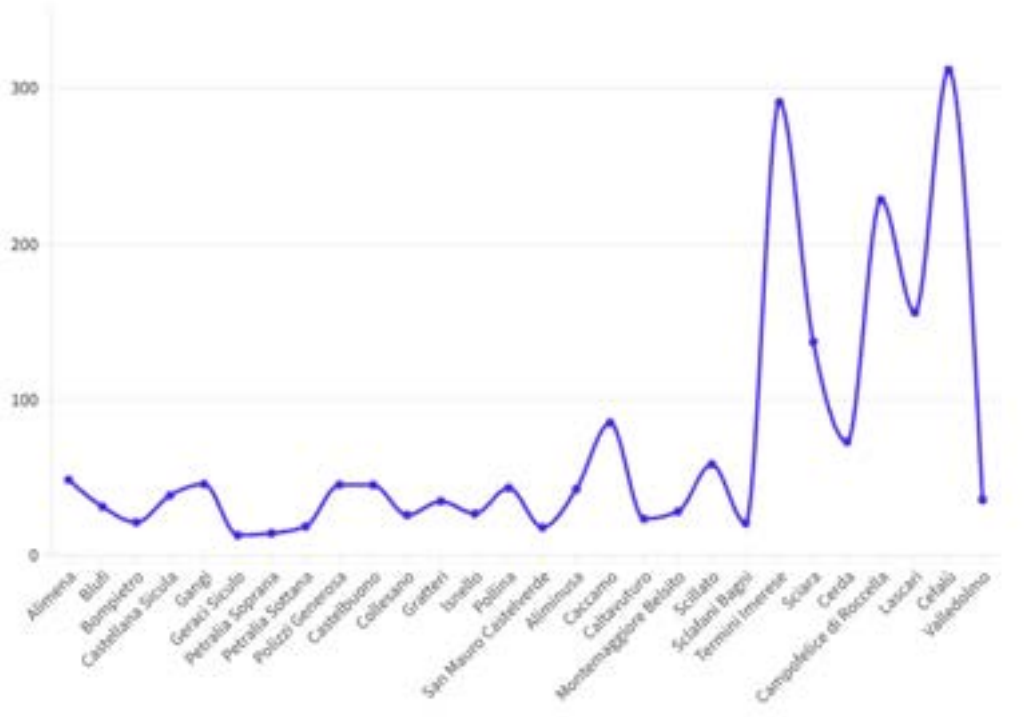


Fig. II.2.6 | *SWOT Analysis - Aspetti demografici ©Luisa Lombardo, 2023*

Saldo migratorio (immigrati e emigrati)
Il saldo migratorio nei comuni siciliani è generalmente negativo, ad eccezione di Termini Imerese, Campofelice di Roccella, Lascari e Cefalù.

Tale saldo negativo risulta più accentuato nelle zone interne, mentre le zone costiere presentano un saldo migratorio meno negativo o addirittura positivo. Il divario tra i saldi migratori dei comuni è notevole.

Numero di stranieri residenti
Il numero di stranieri residenti nei comuni siciliani è in crescita, fatta eccezione per alcuni comuni come Alimena, Blufi e Bompietro.

La presenza di stranieri risulta più elevata nelle zone costiere, mentre le zone interne mostrano generalmente un numero inferiore di residenti stranieri. Il divario tra il numero di stranieri residenti nei comuni è significativo. La situazione attuale del Parco delle Madonie e dei suoi 21 comuni affiliati non presenta una condizione equilibrata. Secondo gli ultimi dati forniti dall'Istituto Nazionale di Statistica (ISTAT), aggiornati al 2023, la popolazione delle Madonie ha subito un significativo decremento, particolarmente evidente negli ultimi anni.

Questo declino è attribuibile non solo alla carenza di opportunità lavorative nella regione, che spinge i giovani a cercare impiego altrove, ma anche alla presenza di una popolazione anziana che permane nell'area.

Al fenomeno dell'emigrazione si aggiungono l'assenza di servizi essenziali

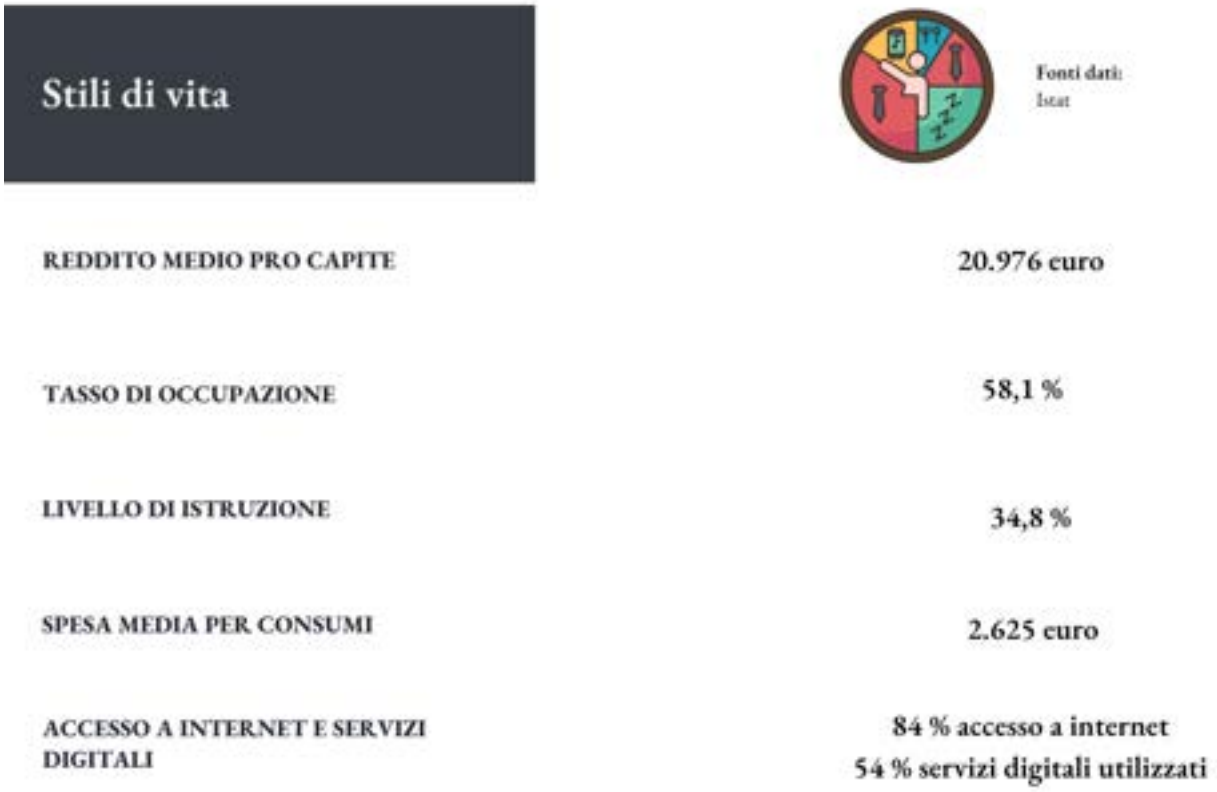


Fig. II.2.7 | *SWOT Analysis - Stili di vita ©2023, Luisa Lombardo*

e la distanza dai capoluoghi circostanti e, di conseguenza, dalle metropoli che offrono servizi più avanzati e diversificati. La popolazione delle Madonie, pertanto, ha subito una diminuzione negli ultimi anni.

La variazione percentuale media della popolazione nei comuni delle Madonie tra il 2013 e il 2023 è del -7,2%. Ciò indica un leggero decremento demografico, ma con una diminuzione complessiva contenuta. Tuttavia, tale calo è più evidente nei comuni di minori dimensioni, caratterizzati da una popolazione numericamente inferiore. Questo fenomeno è associato a vari fattori, quali l'urbanizzazione, l'invecchiamento della popolazione e la mancanza di opportunità lavorative, con possibili conseguenze negative, tra cui la chiusura di servizi pubblici e attività commerciali, il deterioramento del patrimonio culturale e ambientale, l'incremento della criminalità, la difficoltà nel reperire occupazione e il declino della qualità della vita.

L'incidenza della superficie montana e l'area montana delle Madonie coprono circa 3.000 km^2, pari al 60% della superficie totale del territorio e comprensorio.

La densità abitativa media dei comuni delle Madonie è di 22,2 abitanti per km^2. I comuni più densamente popolati includono Cefalù (241,1 ab./km^2), Castelbuono (77,2 ab./km^2), Polizzi Generosa (56,4 ab./km^2), Gangi (55,4 ab./km^2), Petralia Soprana (60,2 ab./km^2) e Petralia Sottana (58,8 ab./km^2). La variazione demografica degli ultimi 10 anni è stata negativa, con una diminuzione complessiva di circa 10.000 abitanti, passando da 160.000 a 150.000 abitanti. Questo declino è attribuibile a fattori come l'emigrazione verso le città, l'invecchiamento della popolazione e la carenza di opportunità lavorative.

L'emigrazione verso le città è il principale fattore di declino demografico delle Madonie, con molte persone che hanno abbandonato la regione in cerca di opportunità lavorative, soprattutto a Palermo e Catania. L'invecchiamento della popolazione è un ulteriore elemento, determinato da bassi tassi di natalità e dall'aumento dell'aspettativa di vita. La mancanza di lavoro è un terzo fattore, con la crisi economica delle Madonie negli ultimi 10 anni che ha portato alla chiusura di molte imprese e all'emigrazione di lavoratori qualificati.

La percentuale di anziani nelle Madonie, secondo i dati ISTAT, è del 25,6%, superiore alla media nazionale del 23,4%. Tale fenomeno è riconducibile alla natura montuosa della regione, che ha storicamente spinto i giovani a emigrare in cerca di opportunità altrove. Il tasso di disoccupazione delle Madonie è del 10,6%, superiore alla media nazionale dell'9,1%. Questo dato è influenzato da vari fattori, tra cui la carenza di opportunità lavorative, l'emigrazione verso le città e l'invecchiamento della popolazione. Un fenomeno in atto in alcuni paesi delle Madonie è l'inserimento di nuova popolazione straniera. Questo per creare nuova popolazione residente e contribuire anche ad un ricambio generazionale.

STILI DI VITA

Per un'analisi SWOT efficace del comparto delle Madonie, è cruciale comprendere anche gli stili di vita della popolazione locale, concentrandosi su alcuni indicatori socioeconomici chiave come il reddito medio pro capite, il tasso di occupazione, il livello di istruzione e la spesa media per consumi[4].

Analizzare il reddito medio pro capite consente di valutare il potere d'acquisto della popolazione, un elemento determinante per comprendere la capacità di spesa e quindi il potenziale di sviluppo economico e turistico della zona. Allo stesso modo, il tasso di occupazione è un indicatore fondamentale della stabilità economica; un tasso elevato suggerisce una popolazione con buone opportunità lavorative, mentre un tasso basso potrebbe indicare sfide significative che richiedono interventi mirati.

Il livello di istruzione della popolazione riveste un ruolo altrettanto importante, poiché un alto livello di istruzione indica una maggiore capacità di adattamento ai cambiamenti e alle innovazioni, facilitando l'attuazione di strategie orientate alla crescita e alla sostenibilità.

Infine, la spesa media per consumi offre una visione delle abitudini di consumo locali, permettendo di individuare settori economici potenzialmente in espansione e di sviluppare prodotti o servizi in linea con le esigenze del territorio. In sintesi, l'analisi di questi fattori è essenziale per delineare con precisione le forze e le debolezze interne del comparto delle Madonie, nonché per identificare opportunità e minacce esterne, consentendo così di elaborare strategie mirate ed efficaci per il suo sviluppo sostenibile.

Reddito medio pro capite
Il reddito medio pro capite nei comuni siciliani si attesta al di sotto della media nazionale, fissata a 20.976 euro. Si rileva un reddito medio pro capite superiore nelle zone costiere, mentre le zone interne evidenziano un reddito medio pro capite inferiore.

Tasso di occupazione
Il tasso di occupazione nei comuni siciliani è inferiore alla media nazionale, fissata al 58,1%. Si registra un tasso di occupazione più elevato nelle zone costiere, mentre le zone interne presentano un tasso di occupazione inferiore.

Livello di istruzione
Il livello di istruzione nei comuni siciliani si attesta al di sotto della media nazionale, che è del 34,8% di diplomati. Si riscontra un livello di istruzione più elevato nelle zone costiere, perchè più fortunate in termini di servizi e anche maggiormente frequentate da turisti, l'economia ha avuto un picco di crescita negli ultimi anni, mentre le zone interne mostrano un livello di istruzione inferiore.

Spesa media per consumi
La spesa media per consumi nei comuni siciliani è inferiore alla media nazionale, fissata a 2.625 euro. Si osserva una spesa media per consumi più elevata nelle zone costiere, mentre le zone interne presentano una spesa media per consumi inferiore. Il divario tra le spese medie per consumi dei comuni risulta significativo.

Accesso a internet e servizi digitali
L'accesso a internet e ai servizi digitali nei comuni siciliani è inferiore alla media nazionale, attestandosi rispettivamente al 84% per l'accesso a internet e al 54% per i servizi digitali utilizzati. Moltissimo è stato fatto per l'implementazione della banda larga e la connessione wireless del comprensorio, tuttavia, si evidenzia un accesso maggiore a internet e ai servizi digitali nelle zone costiere, mentre le zone interne presentano un accesso inferiore. Il divario tra l'accesso a internet e ai servizi digitali dei comuni è significativo.

ECONOMIA
Per un'analisi approfondita dell'economia del comparto delle Madonie, è fondamentale esaminare diversi aspetti chiave come la presenza di attività economiche, i settori maggiormente sviluppati, il PIL pro capite, il tasso di occupazione e i settori economici trainanti.

Valutare la presenza e la distribuzione delle attività economiche nella zona consente di comprendere la struttura economica locale e di identificare eventuali squilibri o aree con potenziale di sviluppo. I settori maggiormente sviluppati forniscono indicazioni su dove si concentrano le risorse e le competenze locali, offrendo un quadro delle aree che attualmente sostengono l'economia del territorio.

Il PIL pro capite è un indicatore critico per misurare la produttività e il benessere economico della popolazione; un PIL pro capite elevato riflette una maggiore capacità di produzione e un livello di vita più alto, mentre un PIL inferiore potrebbe suggerire la necessità di politiche economiche che stimolino la crescita. Il tasso di occupazione, strettamente legato al PIL, rivela la capacità del mercato del lavoro di assorbire la forza lavoro disponibile,

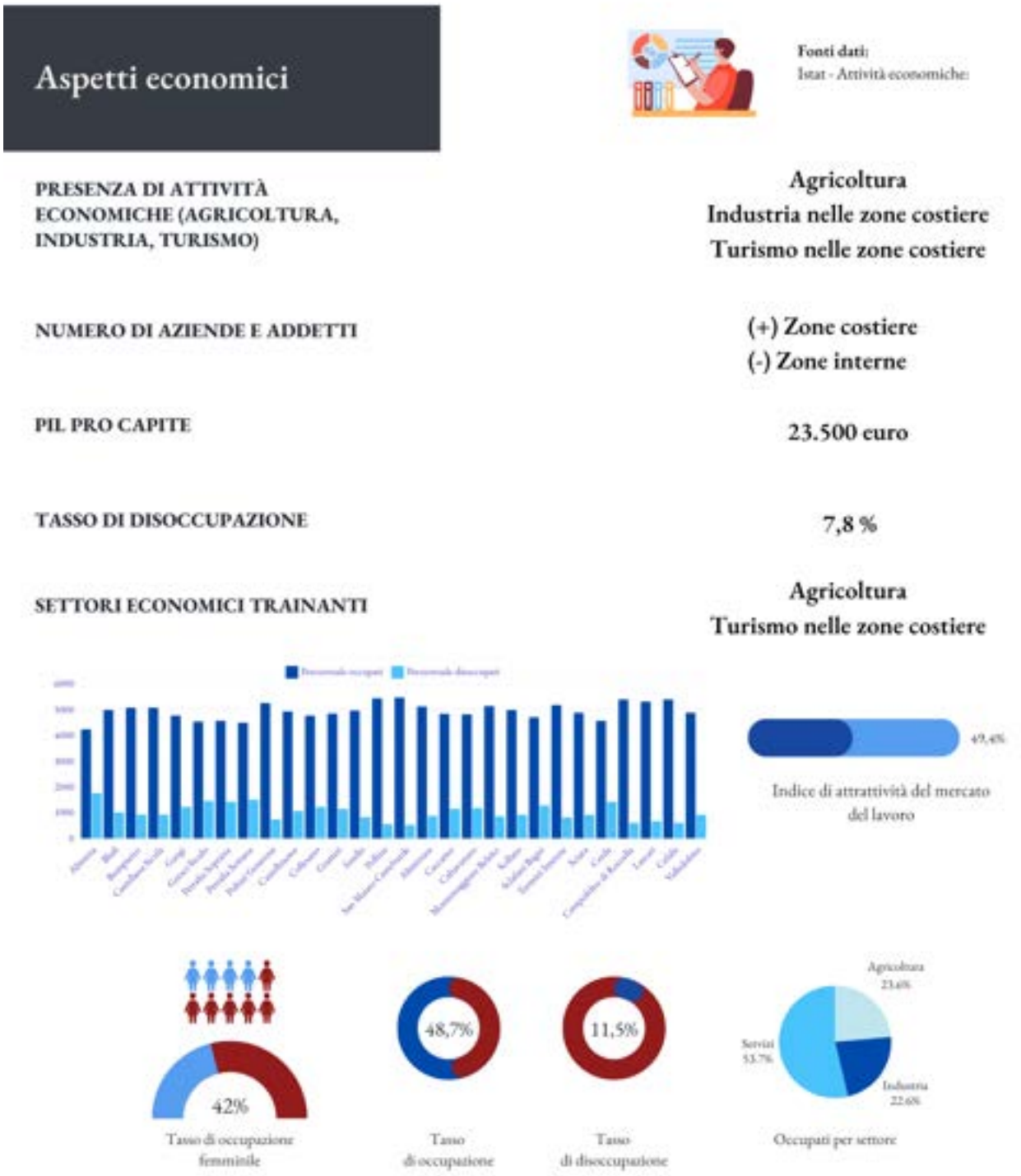


Fig. II.2.8 | *SWOT Analysis - Aspetti economici ©2023, Luisa Lombardo*

influenzando direttamente la stabilità e la coesione sociale della comunità.

Infine, identificare i settori economici trainanti è essenziale per comprendere quali aree dell'economia locale hanno il maggiore impatto sullo sviluppo complessivo del territorio. Questi settori non solo definiscono la direzione attuale dell'economia madonita, ma offrono anche spunti su dove concentrare eventuali investimenti o interventi di politica economica per sostenere ulteriormente la crescita. In sintesi, l'analisi di questi fattori è cruciale per delineare un quadro completo e realistico dell'economia del comparto delle Madonie, consentendo di individuare le strategie più efficaci per promuovere uno sviluppo economico sostenibile e inclusivo.

Presenza di attività economiche (agricoltura, industria, turismo)
L'agricoltura emerge come l'attività economica preponderante nei comuni siciliani con tantissima produzione locale e prodotti della catena *slowfood*. L'industria, invece, mostra una maggiore incidenza nelle zone costiere, mentre nelle zone interne si riscontra una minore presenza di attività industriali.

Il turismo riveste un ruolo economico significativo per numerosi comuni siciliani, specialmente quelli situati lungo le coste. Tuttavia, la diversificazione delle attività economiche si rivela limitata in molti comuni siciliani. La distribuzione settoriale mostra una predominanza nei servizi (53,73%), seguiti dall'agricoltura (23,63%) e poi dall'industria (22,65%).

L'analisi della struttura economica si è focalizzata sull'esame dei settori produttivi presenti nel territorio delle Madonie.
Per quanto riguarda il Settore primario:

- agricoltura: la produzione agricola nella regione delle Madonie è diversificata e comprende cereali, ortaggi, frutta, olive, dunque olio, vino e formaggi;
- allevamento: l'allevamento riveste un ruolo significativo nell'economia delle Madonie e comprende bovini, ovini, caprini, suini e pollame.
- silvicoltura: il territorio delle Madonie è caratterizzato da boschi di faggi, querce, abeti, castagni e pini.

Per il Settore secondario:

- industria: l'industria nelle Madonie è poco sviluppata e comprende aziende operanti nei settori alimentare, tessile, chimico e dei materiali da costruzione;
- edilizia: l'edilizia gioca un ruolo importante nell'economia delle Madonie, soprattutto per la costruzione di abitazioni, alberghi e strutture turistiche.

Per il Settore terziario:

- turismo: il turismo rappresenta il settore predominante nell'economia delle Madonie, essendo la regione una rinomata destinazione turistica per la sua bellezza naturale, patrimonio culturale e attività all'aperto;
- commercio: il settore commerciale è rilevante, con numerosi negozi, supermercati e centri commerciali presenti nei comuni delle Madonie;
- servizi: i comuni delle Madonie ospitano diversi servizi, tra cui scuole, ospedali, banche, uffici pubblici e strutture sportive.

I settori più sviluppati risultano essere comunque il primario e il terziario.

Il settore primario, sebbene essenziale per l'economia delle Madonie, è in declino a causa dell'urbanizzazione e della mancanza di investimenti, ma soprattutto l'assenza di una nuova generazione in grado di portare avanti le antiche tecniche di coltura nonché l'inadeguatezza delle tecnologie che non consentono la loro sostituzione alle antiche tecniche tradizionali. In contrasto, il settore terziario sta crescendo e costituisce la parte preponderante dell'economia delle Madonie.

Il turismo, in particolare, emerge come il settore più significativo, con notevole potenziale per la generazione di occupazione e sviluppo economico. Il sistema agro-industriale regionale siciliano si caratterizza per una marcata presenza nel settore primario, con particolare attenzione alla produzio-

ne di ortaggi, frutta, vino e olio d'oliva.

Il settore secondario è rappresentato da diverse industrie agro-alimentari, come la produzione di pasta, conserve, dolciumi e bevande. Il settore terziario comprende attività legate alla commercializzazione dei prodotti agricoli e all'assistenza tecnica. Nelle Madonie, il sistema agro-industriale mostra uno sviluppo particolare nella produzione di olio d'oliva, riconosciuto come una delle principali produzioni agricole della Sicilia.

Grazie al microclima e al terreno fertile, le Madonie sono una zona vocata per la produzione di olio d'oliva di alta qualità, apprezzato a livello internazionale.

Numero di aziende e addetti

Il numero di aziende e addetti nei comuni siciliani risulta inferiore alla media nazionale in diversi contesti locali. Le zone costiere evidenziano un numero di aziende e addetti superiore rispetto alle zone interne, sottolineando un significativo divario tra le realtà economiche dei comuni.

PIL pro capite

Il Pil pro capite nei comuni siciliani si colloca al di sotto della media nazionale, attestandosi a 23.500 euro. Le zone costiere presentano un Pil pro capite superiore, mentre nelle zone interne si osserva una tendenza inversa, con un Pil pro capite inferiore. Questo divario sostanziale evidenzia disparità economiche significative tra i comuni.

Tasso di disoccupazione

Il tasso di disoccupazione nei comuni siciliani risulta superiore alla media nazionale, che si attesta al 7,8%. Le zone interne presentano un tasso di disoccupazione più elevato rispetto alle zone costiere, indicando una marcata differenza nella dinamica occupazionale tra le diverse aree.

Settori economici trainanti

L'agricoltura continua a essere il settore economico trainante in molte realtà madonite. Il turismo assume una rilevanza notevole soprattutto nei comuni costieri, mentre l'industria mostra una maggiore presenza nelle zone interne. La diversificazione dei settori economici risulta limitata in molte aree, indicando la necessità di promuovere strategie di sviluppo economico più ampie e sostenibili.

Tasso di occupazione e tasso di attività

Come evidenziato, il tasso di occupazione mostra notevoli variazioni da comune a comune. I comuni con il maggiore tasso di occupazione sono San Mauro Castelverde, Pollina e Cefalù, mentre quelli con il minore tasso sono Alimena, Blufi e Bompietro.

Il tasso di occupazione medio si attesta al 48,7%, al di sotto della media nazionale del 58,2%. Tale dato suggerisce che gli abitanti di questi comuni hanno una minore probabilità di occupazione rispetto al resto del paese. Il tasso di occupazione femminile presenta notevoli differenze tra i comuni, variando dal 33,7% di Alimena al 48,0% di San Mauro Castelverde. Il tasso di occupazione femminile medio nei comuni menzionati è del 42,7%, inferiore alla media nazionale del 48,4%. Il tasso di occupazione femminile medio è del 42,7%, inferiore alla media nazionale del 48,4%.

Il tasso di occupazione medio, attestandosi al 48,7%, risulta inferiore alla media nazionale del 58,2%, indicando una minor probabilità di impiego per i residenti nei comuni delle Madonie rispetto al resto del paese. Il tasso di disoccupazione medio è del 11,5%, superiore alla media nazionale del 9,1%. La distribuzione percentuale degli occupati per settore varia tra i comuni: la percentuale nel settore agricolo oscilla tra l'18,9% di Cefalù e il 35,6% di Blufi; nel settore industriale va dal 17,5% di Termini Imerese al 26,9% di Gratteri; nel settore dei servizi si estende dal 54,1% di Caltavuturo al 57,7% di Castellana Sicula. La media complessiva riporta un 23,63% di occupa-

Cultura e Tradizioni

Fonti dati:
Regione Siciliana - Assessorato dei Beni Culturali e dell'Identità Siciliana

NUMERO DI MUSEI, BIBLIOTECHE, SITI ARCHEOLOGICI	Agricoltura Industria nelle zone costiere Turismo nelle zone costiere
EVENTI CULTURALI E TRADIZIONALI	Feste, sagre, eventi regiliosi
ASSOCIAZIONI CULTURALI E DI VOLONTARIATO	Associazione Pro Loco, Associazione Culturale e di Volontariato
PRESENZA DI BENI IMMATERIALI (UNESCO)	Alimena, Petralia Soprana e Polizzi Generosa

LINGUA

LINGUA MADRE DELLA POPOLAZIONE
DIFFUSIONE DEL DIALETTO SICILIANO
CONOSCENZA DI LINGUE STRANIERE

Lingua

Fonti dati:
Regione Siciliana - Assessorato dei Beni Culturali e dell'Identità Siciliana

LINGUA MADRE DELLA POPOLAZIONE	Italiano
DIFFUSIONE DEL DIALETTO SICILIANO	Alta
CONOSCENZA DI LINGUE STRANIERE	Medio - Bassa

Fig. II.2.9 | *SWOT Analysis - Cultura e Tradizioni, Lingua ©2023, Luisa Lombardo*

ti nel settore primario, un 22,65% nell'industria e un 53,73% nei servizi. Il tasso di disoccupazione medio nei comuni è del 11,5%, superiore alla media nazionale del 9,1%.

L'indice di attrattività del mercato del lavoro presenta variazioni tra i comuni, identificando quelli più attrattivi (Pollina, San Mauro Castelverde, Campofelice di Roccella, Lascari, Cefalù) e quelli meno attrattivi (Alimena, Geraci Siculo, Petralia Soprana, Petralia Sottana, Cerda). Il tasso di abbandono per fasce di età oscilla tra lo 0,9% e il 2,2%, con una media del 1,7%, leggermente superiore alla media nazionale del 1,3%. Tale indice viene calcolato tenendo conto di diversi fattori, quali la presenza di infrastrutture adeguate, la qualità della vita, la disponibilità di manodopera qualificata e il costo della vita. Si osserva una significativa variazione dell'indice da comune a comune, con il valore minimo di 46,4% registrato a Pollina e il massimo di 54,9% a Blufi. La media dell'indice di attrattività del mercato del lavoro nei comuni in questione si attesta al 49,6%. Questo valore medio supera la media nazionale, fissata al 47,4%, indicando che i comuni in esame presentano una maggiore capacità di attrarre nuove imprese e posti di lavoro rispetto alla media nazionale. Al fine di evidenziare ulteriormente le disparità di attrattività, si distinguono i comuni con elevata attrattività, tra cui Pollina, San Mauro Castelverde, Campofelice di Roccella, Lascari e Cefalù, da quelli con bassa attrattività, quali Alimena, Geraci Siculo, Petralia Soprana, Petralia Sottana e Cerda. L'analisi dell'indice di attrattività del mercato del lavoro sottolinea una notevole variabilità tra i comuni considerati, con una media dell'indice del 49,6%, superiore alla media nazionale (47,4%). I comuni più attrattivi risultano essere Pollina, San Mauro Castelverde, Campofelice di Roccella, Lascari e Cefalù, mentre quelli con una minore attrattività includono Alimena, Geraci Siculo, Petralia Soprana, Petralia Sottana e Cerda.

Pertanto, è possibile affermare che i comuni in esame presentano un tasso di abbandono leggermente superiore alla media nazionale. L'analisi, considerato in diverse fasce d'età, evidenzia valori compresi tra lo 0,9% e il 2,2%, con una media del 1,7%, risultando così appena al di sopra della media nazionale. La necessità di implementare strategie mirate per mitigare questa tendenza diviene imperativa.

CULTURA E TRADIZIONI

L'analisi della cultura e delle tradizioni[6] nel comparto delle Madonie è essenziale per comprendere l'identità e la vitalità culturale del territorio nonché la vocazione territoriale. Un elemento fondamentale è il numero e la qualità dei centri ricettivi, come biblioteche, musei e siti archeologici, che rappresentano i custodi del patrimonio storico e artistico locale, a questo si aggiungono chiese, castelli e altri monumenti. La presenza di questi luoghi di cultura non solo valorizza la storia e le tradizioni della zona, ma offre anche spazi di incontro e di crescita per la comunità.

Gli eventi culturali e tradizionali sono un altro aspetto cruciale da considerare. Questi eventi, spesso legati alle festività religiose, alle stagioni e alle tradizioni locali, rappresentano momenti di coesione sociale e di trasmissione del patrimonio culturale. Attraverso feste, sagre, rievocazioni storiche e manifestazioni artistiche e feste religiose le Madonie mantengono vive le proprie radici e attraggono visitatori, contribuendo anche allo sviluppo turistico. Ad agiungersi anche la presenza di baby sincaci e un consiglio comunale che portano avanti le antiche tradizioni e si occupano della gestione degli eventi in città. Le associazioni culturali e di volontariato svolgono un ruolo fondamentale nel tessuto sociale delle Madonie. Queste organizzazioni sono spesso il motore di iniziative culturali e sociali, promuovendo la partecipazione attiva dei cittadini e la diffusione della cultura locale. La loro presenza è indicativa di una comunità dinamica e impegnata nella valorizzazione del proprio patrimonio.

Infine, la presenza di beni immateriali, come tradizioni orali, pratiche artigianali e rituali religiosi, è un elemento di grande valore culturale. Questi beni, spesso trasmessi di generazione in generazione, costituiscono l'essenza

dell'identità locale e sono riconosciuti come parte integrante del patrimonio culturale delle Madonie. La salvaguardia e la valorizzazione di questi beni immateriali sono cruciali per preservare la ricchezza culturale del territorio e per garantirne la continuità nel tempo.

L'analisi della cultura e delle tradizioni nelle Madonie permette di comprendere non solo le radici storiche del territorio, ma anche la vitalità culturale e sociale che lo caratterizza, offrendo spunti preziosi per la promozione di iniziative che rafforzino l'identità locale e il benessere della comunità.

Numero di chiese, musei, biblioteche, siti archeologici

Il numero dei beni presenti nei comuni siciliani risulta inferiore alla media nazionale; fa eccezione Polizzi Generosa con i suoi tantissimi beni monumentali sparsi nel territorio. Le zone costiere registrano un maggior numero di queste istituzioni culturali come Cefalù, con il suo patrimonio UNESCO, che attira turisti da tutto il mondo, mentre le zone interne evidenziano una presenza meno consistente. Tale divario significativo sottolinea disparità culturali e patrimoniali tra i vari comuni.

Eventi culturali e tradizionali

Ciascun comune è arricchito da numerose celebrazioni culturali, tradizionali e religiose, prevalentemente concentrate nel mese di agosto. Le aree interne conservano tradizioni antiche e riti ininterrotti, trasmettendo tali ricchezze di generazione in generazione. Nei mesi estivi vi è una concentrazione maggiore di eventi locali.

Associazioni culturali e di volontariato

Il territorio siciliano ospita numerose Associazioni Pro Loco, Associazioni Culturali e di Volontariato, con almeno una presente in ogni comune. Queste associazioni svolgono un ruolo fondamentale nella promozione e salvaguardia del patrimonio culturale locale, tuttavia, non sono al momento utili allo sviluppo territoriale. Si attesta, infatti, una non presenza di bandi europei nelle zone interne da parte di associazioni, pro loco e APS in grado di portare a compimento bandi per attività nel territorio.

Presenza di beni immateriali

La maggior parte dei beni immateriali nella regione sono legati a feste religiose e tradizioni popolari, evidenziando l'importanza della religione e del folklore nella vita delle comunità siciliane. Alcuni comuni, come i canti di Alimena, sono patrimonio immateriale, concentrano un notevole numero di tali beni immateriali UNESCO. La presenza di questi nelle Madonie rappresenta un significativo valore aggiunto per il territorio, contribuendo all'attrattiva turistica e alla valorizzazione della ricca cultura locale.

LINGUA, TECNOLOGIA E SICUREZZA

Analizzare gli aspetti legati alla lingua, alla tecnologia e alla sicurezza dei luoghi nel comparto delle Madonie è fondamentale per comprendere come questi elementi influenzino la vita quotidiana e lo sviluppo del territorio. La lingua, con particolare attenzione al dialetto locale, a volte diverso da siciliano e volubile in base alle zone, è un pilastro dell'identità culturale delle Madonie. La conservazione e la valorizzazione del dialetto non solo preservano la memoria storica e le tradizioni, ma rafforzano anche il senso di appartenenza delle nuove generazioni alla loro terra.

La tecnologia gioca un ruolo sempre più centrale nella modernizzazione del territorio. L'espansione delle infrastrutture digitali, come la disponibilità di internet ad alta velocità e l'integrazione di tecnologie avanzate nei processi produttivi, contribuisce significativamente alla competitività economica delle Madonie. L'uso delle tecnologie può migliorare l'efficienza dei servizi pubblici, facilitare l'accesso alle informazioni e stimolare l'innovazione. Tuttavia, è essenziale affrontare il divario digitale per garantire che tutti i cittadini possano trarre beneficio dalle nuove opportunità tecnologiche, evitando

Paesaggio

Fonti dati:
Istat

SUPERFICIE TERRITORIALE (KMQ)	1.649,64 Kmq
ALTITUDINE	(+) Geraci Siculo (-) Termini Imerese
TIPOLOGIA DI PAESAGGIO (MONTAGNA, COLLINA, PIANURA)	Paesaggio alternato
PRESENZA DI AREE PROTETTE	Parco delle Madonie

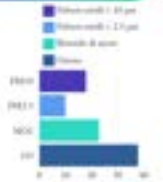
TERRITORIO

USO DEL SUOLO (AGRICOLO, FORESTALE, URBANO)
RISORSE IDRICHE
RISCHIO IDROGEOLOGICO
QUALITÀ DELL'ARIA

Territorio

USO DEL SUOLO (AGRICOLO, FORESTALE, URBANO)	Agricolo e Forestale
RISORSE IDRICHE	Sorgenti montane
RISCHIO IDROGEOLOGICO	Elevato
QUALITÀ DELL'ARIA	Ottima

Inquinamento atmosferico



Biodiversità

Fig. II.2.10 | SWOT Analysis - Paesaggio e Territorio ©2023, Luisa Lombardo

che alcune aree o gruppi sociali rimangano indietro.

La sicurezza dei luoghi è un elemento cruciale per la qualità della vita e lo sviluppo economico. Un ambiente sicuro non solo rassicura i residenti, ma è anche un fattore determinante per attrarre turisti e investimenti. Misure come l'installazione di sistemi di videosorveglianza, una buona illuminazione pubblica, la manutenzione delle infrastrutture e la presenza attiva delle forze dell'ordine contribuiscono a creare un contesto sicuro e accogliente.

In sintesi, un approccio integrato che preservi la lingua e le tradizioni locali, promuova l'adozione di tecnologie moderne e garantisca la sicurezza del territorio è essenziale per sostenere uno sviluppo sostenibile delle Madonie, migliorando il benessere della comunità e la sua capacità di attrarre risorse esterne.

LINGUA

- **Lingua madre della popolazione:** Italiano e Siciliano
- **Diffusione del dialetto siciliano:** Il dialetto siciliano è ancora molto diffuso nelle Madonie, soprattutto nelle zone rurali e montane.
- **Conoscenza di lingue straniere:** La conoscenza di lingue straniere è ancora limitata, soprattutto nelle fasce d'età medio-anziane.

TECNOLOGIA

Diffusione di internet e banda larga

La copertura internet nei comuni delle Madonie è generalmente estesa, con una media del 90%. Tuttavia, la disponibilità della banda larga risulta ancora limitata in alcune zone, con una velocità media di 10 Mbps; i centri non sono dotati di Free Wi-Fi nel centro storico. I comuni montani presentano la minore diffusione di internet e banda larga, indicando una necessità di miglioramenti infrastrutturali in queste regioni.

Utilizzo di smartphone e computer

L'utilizzo di smartphone e computer nelle Madonie è piuttosto diffuso, con una media del 75% per gli smartphone e del 45% per i computer. I comuni con la maggiore adozione di smartphone e computer sono quelli con una popolazione più giovane e con un livello di istruzione più elevato come Castalbuono. Tuttavia, persiste un divario digitale, soprattutto nelle zone rurali e montane, sottolineando la necessità di iniziative per colmare questa disparità.

E-government **(servizi online della pubblica amministrazione)**

La diffusione dei servizi online della pubblica amministrazione nei comuni delle Madonie è ancora limitata; pur possedento in alcuni casi portali di amministrazione trasparente aggiornati, non è ancora possibile l'uso di portali *smart*, come quelli del Comune di Palermo, per pratiche amministrative da portare a compimento *online*. La maggior parte dei comuni offre solo servizi di base, quali l'anagrafe, i certificati e i pagamenti. Pochi comuni forniscono servizi più avanzati, come la prenotazione di appuntamenti online o uno sportello online. Il divario digitale persiste, con i comuni montani che presentano la minore diffusione di servizi online. Stessa cosa può essere espressa circa i servizi di assistenza, come per lo SPID.

Presenza di aziende ICT

La presenza di aziende ICT nelle Madonie è scarsamente diffusa, con una media di 2 aziende per comune. Si distinguono, infatti, alcune aziende come il Caseificio Barreca, azienda agro-zootecnica, unica nel territorio ad aver integrato le tecnologie per un miglioramento in termini di produzione. Tuttavia, il divario digitale continua a essere evidente sottolineando la necessità di promuovere l'adozione di tecnologie digitali in queste aree.

SICUREZZA

- **tassi di criminalità (reati contro la persona e il patrimonio):** I tassi di

criminalità nelle Madonie sono generalmente bassi.
- **presenza di forze dell'ordine:** La presenza di forze dell'ordine è capillare sul territorio.
- **percezione della sicurezza da parte dei cittadini:** La percezione della sicurezza da parte dei cittadini è generalmente alta.

PAESAGGIO E TERRITORIO

Le differenze tra paesaggio e territorio sono sottili, ma significative soprattutto quando si analizzano contesti come quello delle Madonie.

Il territorio si riferisce principalmente a uno spazio fisico delimitato, caratterizzato da componenti naturali e artificiali come montagne, fiumi, infrastrutture e insediamenti umani. È un concetto che implica la gestione e l'organizzazione dello spazio da parte dell'uomo, con un'attenzione particolare alla pianificazione e all'uso delle risorse.

Il paesaggio, invece, è una nozione più ampia e include non solo gli elementi fisici del territorio, ma anche la percezione estetica e culturale che le persone hanno di esso, nonchè i principi di tutela e conservazioni ad oggi vigenti nel territorio in esame. Il paesaggio è quindi il risultato dell'interazione tra l'uomo e l'ambiente, e riflette la storia, le tradizioni e le emozioni associate a un luogo. Con queste premesse, possiamo ora introdurre un'analisi specifica del paesaggio e del territorio delle Madonie:

PAESAGGIO

- **superficie territoriale (kmq):** La superficie territoriale è di 1.649,64 Km^2;
- **altitudine:** L'altitudine massima si registra a Geraci Siculo, a 1.050 m s.l.m., mentre la minima a Termini Imerese, a 50 m s.l.m.;
- **tipologia di paesaggio (montagna, collina, pianura):** Le montagne, le colline e le pianure si alternano, creando un paesaggio unico e suggestivo, in misura maggiore, tuttevia si trovano i rilievi montuosi;
- **presenza di aree protette:** Il Geopark UNESCO delle Madonie.

TERRITORIO

<u>Uso del suolo</u> **(agricolo, forestale, urbano)**

La prevalenza dell'uso agricolo e forestale indica un'economia rurale e un forte legame con la tradizione. La diversificazione delle colture e l'adozione di pratiche agricole sostenibili possono contribuire a preservare la fertilità del suolo e la biodiversità.

<u>Risorse idriche</u>

L'abbondanza di sorgenti montane rappresenta un punto di forza per il territorio, terme e anche nevai spersi nel territorio e fonti d'acqua naturali non ancora sfruttate, come recentemente riscontrato a Polizzi Generosa. La gestione efficiente delle risorse idriche è fondamentale per garantirne la disponibilità per le generazioni future. Investimenti in infrastrutture e tecnologie innovative possono ridurre gli sprechi e migliorare l'efficienza dell'irrigazione.

<u>Rischio idrogeologico</u>

L'elevato rischio idrogeologico in alcune zone richiede interventi di messa in sicurezza del territorio. La pianificazione urbanistica e la realizzazione di opere di difesa del suolo possono ridurre il rischio di frane e alluvioni. La sensibilizzazione dei cittadini sui rischi idrogeologici è fondamentale per la prevenzione di danni e disastri. Gran parte del territorio presenta tratti di vulnerabilità e fragilità trovandosi in zona sismica 2, ovvero con sismicità medio-alta.

<u>Qualità dell'aria</u>

La buona qualità dell'aria nella maggior parte dei comuni è un elemento positivo per la salute dei cittadini. L'inquinamento atmosferico nei comuni

costieri è preoccupante e richiede misure di contenimento. La promozione della mobilità sostenibile e l'adozione di tecnologie pulite possono contribuire a migliorare la qualità dell'aria.
Alcuni comuni, quali Alimena, Blufi, Bompietro, Castellana Sicula, Gangi, Geraci Siculo, Petralia Soprana, Petralia Sottana, Polizzi Generosa, Castelbuono, Collesano, Gratteri, Isnello e Pollina, sono ubicati in aree montane caratterizzate da un ambiente relativamente incontaminato. Al contrario, altri comuni, tra cui San Mauro Castelverde, Aliminusa, Caccamo, Caltavuturo, Montemaggiore Belsito, Scillato, Sclafani Bagni, Termini Imerese, Sciara, Cerda, Campofelice di Roccella, Lascari e Cefalù, sono collocati in aree pianeggianti e presentano un ambiente più antropizzato e, dunque, più inquinato.

In termini generali, lo stato ambientale del comprensorio risulta positivo, tuttavia, sussistono alcune problematiche che richiedono intervento. Una delle criticità maggiori è rappresentata dall'inquinamento atmosferico, principalmente attribuibile al traffico veicolare e alle attività industriali. Infine, la deforestazione costituisce un'importante problematica, causata principalmente dall'espansione delle attività agricole e dall'urbanizzazione; in egual maniera, l'innesto di vegetazione non autoctona rappresenta un problema legato al richio del mantenimento della biodiversità. L'analisi ambientale ha evidenziato che alcuni comuni delle Madonie conservano un ambiente relativamente incontaminato; questo perchè soprattutto i comuni che lambiscono il grande Parco delle Madonie, sono tra le zone A e B ovvero in riserva integrale e generale, mentre altri, specialmente nelle zone costiere e urbane, presentano un grado maggiore di antropizzazione. L'inquinamento atmosferico, derivante da traffico e attività industriali, costituisce una sfida rilevante, così come l'inquinamento idrico e la deforestazione. Pur mantenendosi generalmente entro i limiti di legge, alcune aree manifestano specifiche criticità.

In generale, i livelli di inquinamento[1] derivanti da PM10, PM2.5, NO_2 e O_3 risultano al di sotto dei limiti stabiliti dalla normativa italiana ed europea. Tuttavia, alcune criticità emergono:

- **PM10:** Termini Imerese evidenzia un valore di PM10 (22 $\mu g/m^3$) superiore alla media (18 $\mu g/m^3$) e al limite di legge (20 $\mu g/m^3$);
- **PM2.5:** Termini Imerese (13 $\mu g/m^3$) e Cefalù (12 $\mu g/m^3$) presentano valori di PM2.5 superiori alla media (10 $\mu g/m^3$) e al limite di legge (5 $\mu g/m^3$);
- **NO_2:** Termini Imerese (27 $\mu g/m^3$) e Caccamo (25 $\mu g/m^3$) registrano valori di NO2 superiori alla media (23 $\mu g/m^3$) e al limite di legge (40 $\mu g/m^3$);
- **O_3:** Tutti i comuni, ad eccezione di Pollina e San Mauro Castelverde, superano il limite di legge per l'O3 (40 $\mu g/m^3$).

Pollina e San Mauro Castelverde distinguono per valori più bassi di tutti gli inquinanti. In generale, i comuni montani e rurali tendono ad avere un'aria più pulita rispetto ai comuni costieri e urbani per le motivazioni di cui sopra.

Confrontando i dati ISTAT con quelli degli anni precedenti, si evidenzia una generale diminuzione dei livelli di inquinamento in tutti i comuni. Questo trend positivo è attribuibile principalmente al miglioramento delle tecnologie di combustione e all'adozione di politiche ambientali più stringenti e vicine ai principi dell'Agenda 2030.

L'**Indice di Biodiversità** (IBI) si configura come un indicatore sintetico utilizzato per quantificare la biodiversità di un'area specifica. Tale indice è determinato attraverso la considerazione di vari parametri, tra i quali spiccano la ricchezza di specie, l'abbondanza di specie e la diversità genetica. I valori dell'IBI si collocano su una scala da 0 a 5, dove punteggi più elevati indicano una maggiore biodiversità. Per facilitare la valutazione, la biodiversità è stata classificata in tre fasce:

[1] **PM10 e PM2.5:**
- PM10: Le polveri sottili con diametro aerodinamico inferiore a 10 micrometri (μm).
- PM2.5: Le polveri sottili con diametro aerodinamico inferiore a 2.5 micrometri (μm).

Le polveri sottili sono un insieme di particelle solide e liquide sospese in aria.

Sono classificate in base al loro diametro aerodinamico, che ne determina la capacità di penetrare nel sistema respiratorio.

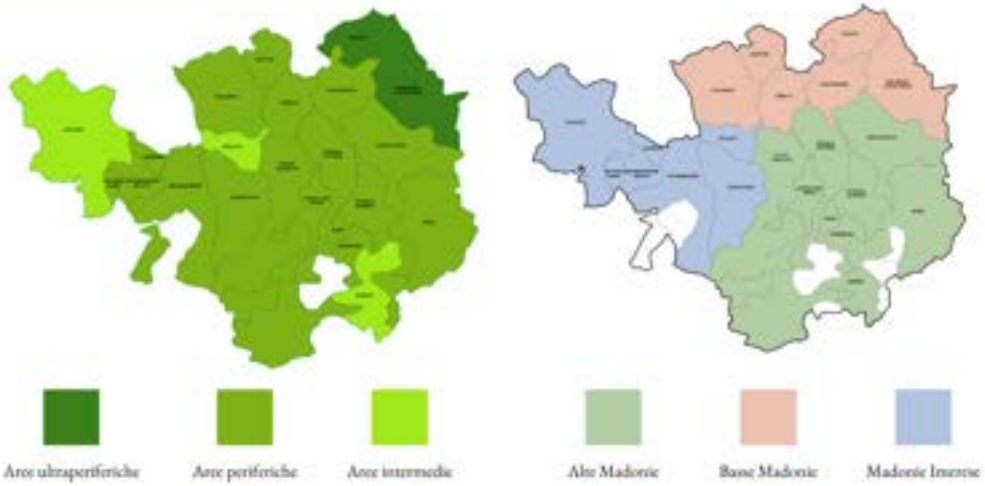
Le PM10 e PM2.5 sono le più pericolose per la salute umana in quanto possono raggiungere i polmoni e la circolazione sanguigna.

L'esposizione a queste polveri può causare diverse malattie respiratorie e cardiovascolari, come asma, bronchite, polmonite e cancro ai polmoni.

NO_2: Biossido di azoto: un gas tossico prodotto principalmente dalla combustione di combustibili fossili, come il gasolio e il metano. L'esposizione al biossido di azoto può causare diverse malattie respiratorie, come asma, bronchite e bronchiolite.

O_3: Ozono: un gas presente naturalmente nell'atmosfera, ma la sua concentrazione può aumentare a causa dell'inquinamento atmosferico. L'esposizione all'ozono può causare diverse malattie respiratorie, come asma, bronchite e irritazione agli occhi, al naso e alla gola.

Distanza e Altimetria



	Comune	Km²
ALTE MADONIE	Alimena	59,7
	Blufi	20,5
	Bompietro	42,4
	Castellana Sicula	72,5
	Gangi	127,1
	Geraci Siculo	112,0
	Petralia Soprana	56,0
	Petralia Sottana	178,4
	Polizzi Generosa	134,7
BASSE MADONIE	Castelbuono	60,5
	Collesano	108,0
	Gratteri	38,0
	Isnello	50,2
	Pollina	49,0
	San Mauro Castelverde	114,0
IMERESE	Alimnusa	13,0
	Caccamo	188,2
	Cattavuturo	97,2
	Montemaggiore Belsito	31,0
	Scillato	30,8
	Sciafani Bagni	134,8
	TOT	1.720,1

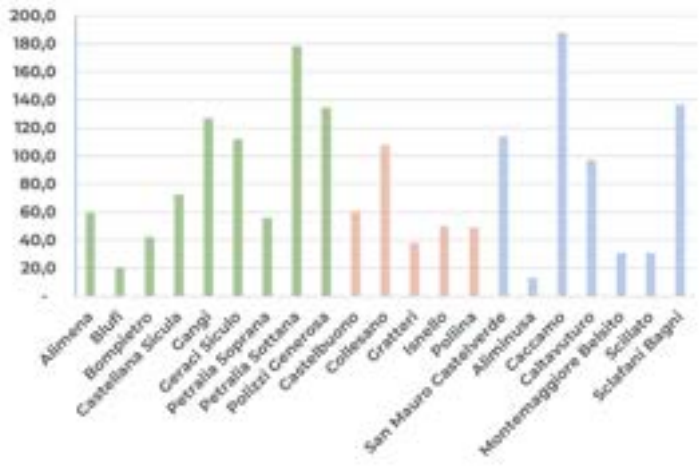


Fig. II.2.11 | *SWOT Analysis - Distanza e Altimetria ©2023, Luisa Lombardo*

- basso: IBI < 4
- medio: 4 <= IBI < 4.5
- medio-alto: IBI >= 4.5

Analizzando questa prospettiva, alcuni comuni emergono con una maggiore biodiversità. Termini Imerese, zona prettamente industriale, risalta per una minore biodiversità rispetto al resto dei comuni considerati.

È cruciale sottolineare che la biodiversità costituisce un elemento fondamentale per la salute degli ecosistemi e il benessere umano. La perdita di biodiversità rappresenta una problematica seria, poiché minaccia aspetti cruciali come la sicurezza alimentare, la qualità dell'acqua e, in ultima analisi, la salute umana. Questo sottolinea l'importanza critica di adottare misure volte a preservare gli habitat naturali e le specie selvatiche.

In tale contesto, è imperativo proteggere la biodiversità attraverso l'attuazione di strategie mirate alla conservazione degli habitat naturali e alla salvaguardia delle specie selvatiche. La variabilità dell'indice di biodiversità tra i comuni mette in luce quelli con una maggiore e minore biodiversità, guidando l'attenzione verso aree che richiedono particolare attenzione nella conservazione della diversità biologica.

LOGISTICA

Distanza

Conformemente alla Strategia SNAI, l'Accordo di partenariato identifica le aree interne come il complesso dei comuni inclusi nelle aree intermedie, periferiche e ultra periferiche. Ciò è conseguente all'individuazione dei poli e alla classificazione dei restanti comuni in quattro fasce distintive (intermedie, periferiche, ultraperiferiche), ottenuta mediante il calcolo della distanza tra le aree più periferiche e i comuni centrali di riferimento. Tale divisione è valida anche per l'Area delle Madonie come da figura.

Altimetria

Il territorio delle Madonie può essere suddiviso, a sua volta, in ulteriori tre aree come Alte e Basse Madonie e Madonie Imerese. Queste suddivisioni non rispecchiano l'altimetria dei luoghi che, pur facendo parte di categorie differenti, presentano quote sul livello del mare variabili, sia superiori che inferiori.

EDILIZIA E PATRIMONIO IN DISUSO

EDILIZIA

Immobili in uso

Il numero complessivo di immobili presenti nei comuni siciliani ammonta a circa 45.000 unità. Di questa cifra, circa 36.000 costituiscono abitazioni, mentre le rimanenti 9.000 sono classificate come non abitazioni.

Negli ultimi anni, si è osservato un decremento nel numero di abitazioni, a differenza di un incremento nel numero di non abitazioni.

Questo andamento potrebbe essere attribuibile al fenomeno dello spopolamento delle aree rurali e alla tendenza di concentrazione della popolazione nelle zone urbane.

Nell'analisi dei comuni, emerge che Termini Imerese, Cefalù e Castelbuono presentano la maggiore concentrazione di immobili, mentre Blufi, Bompietro e Gratteri registrano il minor numero di unità immobiliari. È da notare che il rapporto tra abitazioni e non abitazioni varia notevolmente da comune a comune. A titolo esemplificativo, a Termini Imerese il rapporto è di 4:1, mentre a Scillato si attesta su un rapporto di 3:1.

Immobili in disuso

Per quanto concerne gli immobili in disuso, il governo italiano ha da tempo riconosciuto la necessità di adottare iniziative legislative per affrontare lo stato di vetustà del patrimonio edilizio, soprattutto alla luce dei significativi fondi europei disponibili per la rigenerazione delle aree interne. Questi territori, spesso periferici e caratterizzati da un'economia prevalentemente

agricola, come i piccoli villaggi dell'entroterra, sono afflitti da gravi problemi come lo spopolamento, la mancanza di lavoro e l'invecchiamento della popolazione, accompagnati da una scarsa presenza di giovani (Campisi, T., Colajanni, S., Lombardo, L., 2022). Il censimento del patrimonio immobiliare italiano condotto dall'Istat nel 2011 ha evidenziato la presenza di circa 743.435 immobili residenziali inutilizzati, con una concentrazione maggiore nel Sud Italia e nelle Isole, tra cui la Sicilia. In Sicilia, infatti, si contano attualmente 131.098 edifici in disuso.

La problematica degli immobili abbandonati apre la strada a iniziative di recupero e valorizzazione, volte a contrastare l'abbandono e a creare nuove opportunità di sviluppo per le comunità locali. Una delle iniziative più conosciute è il progetto "**Case a 1 euro**"[2], che ha attirato circa 7.000 cittadini italiani e ha ricevuto oltre 2.000 richieste di partecipazione. Finora, 108 case sono state assegnate in varie regioni italiane, mentre 60 sono attualmente in vendita e circa 32 lotti agrari devono ancora essere assegnati. Questo progetto, incentivato da bonus edilizi, si propone di rivitalizzare aree interne e borghi disabitati, stimolando il mercato immobiliare, l'attività turistica e la creazione di strutture ricettive diffuse.

Anche in Sicilia il progetto "Case a 1 euro" ha ottenuto risultati positivi. Questi interventi si inseriscono in una più ampia strategia di sviluppo territoriale, che non mira solo al recupero edilizio, ma anche alla promozione di nuovi modelli di fruizione del patrimonio culturale.

Le discrepanze tra i vari Comuni siciliani in merito agli immobili in disuso sono significative. Comuni come Cefalù, Caccamo e Castelbuono mostrano le percentuali più alte di edifici non utilizzati (rispettivamente 23,7%, 21,3% e 20,1%). Al contrario, località come Termini Imerese (6,3%), Sciara (6,7%) e Gratteri (7,2%) evidenziano le percentuali più basse. Non emerge una tendenza geografica netta, ma è evidente una maggiore concentrazione di immobili in disuso nelle aree montane della Sicilia.

I numerosi progetti di rigenerazione, come "Vitti a tia" a Polizzi Generosa, e l'impegno di investitori esteri, dimostrano che il recupero degli immobili abbandonati non solo contrasta lo spopolamento, ma contribuisce anche alla crescita economica e alla valorizzazione turistica delle aree interne. Iniziative come queste sono essenziali per garantire un futuro sostenibile alle comunità locali, trasformando il patrimonio edilizio inutilizzato in una risorsa strategica per lo sviluppo.

Analisi SWOT conclusiva per il Parco delle Madonie

Da questa grande analisi effettuata (*Fig. 10*) all'interno del Parco delle Madonie, in sintesi, si evidenzia che:

<u>Punti di Forza</u>**:**

- **Rilevanza Storica e Artistica:** Il Parco delle Madonie è caratterizzato da una profonda rilevanza storica, artistica, architettonica, ma soprattutto naturalistica;
- **Designazione UNESCO:** Nel 2015, il parco ha ottenuto la prestigiosa designazione di Geoparco UNESCO, confermando il suo status internazionale. É dunque un territorio privilegiato;
- **Variegati Paesaggi e Grotte:** Le caratteristiche geologiche, i paesaggi diversificati e le affascinanti grotte attraggono studiosi e visitatori.

<u>Opportunità</u>**:**

- **Turismo Sostenibile:** Sfruttare la bellezza e il patrimonio natuale e architettonico per attrarre turismo sostenibile e nuove generazioni;
- **Produzione di Prodotti Locali:** Promuovere i prodotti locali di alta qualità, inclusi quelli Slow Food, per contribuire all'eccellenza territoriale e alla sostenibilità economica.

<u>Punti di Debolezza</u>**:**

- **Spopolamento:** La regione affronta la sfida dello spopolamento, con l'esodo dei giovani verso i centri urbani;
- **Mancanza di Opportunità di Lavoro:** La mancanza di opportunità di

[1] Il libro "Case a 1 € nei borghi d'Italia. Sambuca di Sicilia: un esempio di successo nel governo del territorio" offre una riflessione multidisciplinare sull'esperienza delle case a 1 euro a Sambuca di Sicilia, coinvolgendo urbanisti, sociologi, esperti di sviluppo locale e progettazione europea, analisti del turismo, giuristi e amministratori locali. Attraverso approcci metodologici diversi e registri linguistici variegati, il volume analizza le peculiarità di questa iniziativa, l'impatto mediatico globale — oltre 100.000 email da tutto il mondo, copertura su emittenti internazionali e il completamento di numerose vendite immobiliari — e i motivi alla base del suo successo. In parallelo, racconta la storia di una comunità e di un borgo che, ripensando la propria traiettoria evolutiva, ha saputo mobilitare visioni e risorse per il rilancio del territorio.
Ferreri, F. (2021). Case a 1 € nei borghi d'Italia. Sambuca di Sicilia: un esempio di successo nel governo del territorio. Dario Flaccovio Editore. ISBN 9788857912219

lavoro redditizie e iniziative imprenditoriali innovative ostacola il progresso sostenibile.

<u>Minacce</u>:

- **Declino della Vitalità:** Lo spopolamento e la mancanza di opportunità di lavoro costituiscono minacce al declino progressivo della vitalità;
- **Perdita di Vitalità Economica:** La mancata risoluzione delle sfide potrebbe portare a un ulteriore declino e alla perdita della vitalità economica.

Il Parco delle Madonie gode di una ricca eredità, ma affronta sfide significative legate alla depopolazione e alla mancanza di opportunità economiche. Per sfruttare appieno il suo potenziale, è essenziale promuovere il turismo sostenibile, valorizzare i prodotti locali e incentivare iniziative imprenditoriali innovative. Investire nella ricerca, nell'innovazione e nell'architettura può contribuire a sviluppare soluzioni sostenibili per affrontare le sfide uniche della regione, assicurando un futuro prospero per il Parco delle Madonie.

L'analisi SWOT del Parco delle Madonie evidenzia una realtà ricca di potenzialità ma allo stesso tempo afflitta da sfide significative. La sua designazione come Geoparco UNESCO e le caratteristiche geologiche uniche creano una base solida per lo sviluppo sostenibile e il turismo. Tuttavia, la depopolazione e la mancanza di opportunità di lavoro rappresentano minacce concrete che richiedono una risposta strategica (Di Prima et al., 2013).

È incoraggiante notare come il patrimonio storico e architettonico della regione possa costituire un'opportunità per attrarre nuove generazioni e imprese innovative. La promozione del turismo sostenibile e la valorizzazione dei prodotti locali, in particolare quelli Slow Food, possono contribuire in modo significativo all'eccellenza territoriale e alla sostenibilità economica.

Tuttavia, per affrontare con successo le sfide della depopolazione e della mancanza di opportunità di lavoro, è fondamentale un approccio olistico che coinvolga la ricerca, l'innovazione e l'architettura. Soluzioni sostenibili e tecnologiche possono emergere per rispondere ai bisogni unici della regione, contribuendo così a garantire un futuro prospero per il Parco delle Madonie. In definitiva, questa analisi sottolinea l'importanza di una gestione strategica e di interventi mirati per preservare e valorizzare questo patrimonio naturale e culturale. Far fronte alle sfide attuali potrebbe non solo preservare la vitalità economica della regione ma anche garantire che le Madonie continuino a essere un gioiello unico, attraente per le generazioni presenti e future.

Quanto appena elaborato serve per fornire un nuovo quadro sintetico rispetto alle ultime dinamiche SNAI e ai censimenti effettuati per delineare non solo le problematiche presenti, ma anche valutare e valorizzare quanto già c'è o potrebbe esserci, in maniera propositiva. I dati fino ad ora analizzati e messi in campo, traggono spunto dal lontano 2015, un periodo lontano che non mette a sistema le dinamiche e i cambiamenti significativi nel territorio. É opportuno, infatti, tener conto delle peculiarità territoriali al fine di identificare, nell'ottica di promuovere *Smart Villages*, qualsiasi elemento che può essere utile, ma anche determinante, per individuare strategie e opportunità per portare a termine e a goal gli strumenti e gli obiettivi della Ricerca.

SWOT ANALYSIS

STRENGTHS	WEAKNESS
Il Parco delle Madonie è una vasta area naturale di profondo valore storico, artistico, architettonico e naturale. Si tratta della seconda maggiore area verde dell'isola e nel 2015 ha ottenuto il prestigioso riconoscimento di Geoparco UNESCO. Le caratteristiche geologiche, i paesaggi diversificati e le affascinanti grotte del territorio attirano studiosi e catturano l'interesse dei visitatori. I ventuno borghi all'interno del parco prosperano come baluardi del paesaggio, contribuendo alla ricca storia della regione. La produzione di prodotti locali di alta qualità, inclusi quelli certificati Slow Food, arricchisce l'eccellenza territoriale e rappresenta il 60-70% dei prodotti locali siciliani.	Le Madonie affrontano la sfida dello spopolamento, che porta a un progressivo declino della vitalità di molti comuni e frazioni. L'esodo della popolazione giovanile verso i centri urbani rappresenta una problematica, spinto dalla ricerca di opportunità lavorative, servizi e un ambiente più dinamico. La mancanza di opportunità di lavoro redditizie e di iniziative imprenditoriali innovative ostacola il progresso sostenibile.
OPPORTUNITIES	**THREATS**
L'eccezionale patrimonio estetico, storico e architettonico della regione delle Madonie offre opportunità per attrarre nuove generazioni e imprese innovative. La ricerca, l'innovazione e l'architettura possono rispondere alle esigenze del territorio. Soluzioni sostenibili e tecnologiche stanno emergendo per soddisfare i requisiti unici della regione.	Le sfide dello spopolamento, del declino della vitalità e della mancanza di opportunità lavorative rappresentano minacce per il futuro della regione delle Madonie. Il mancato intervento su queste problematiche potrebbe portare a un ulteriore declino e alla perdita di vitalità economica.

Fig. II.2.11 | SWOT Analysis Madonie ©2023, Luisa Lombardo

II.2.2 Questionari e sondaggi. Approccio partecipativo con la comunità

Al metodo quantitativo, è stato poi affiancato quello qualitativo tramite un questionario somministrato durante la *Summer School*[1] (vedi Cap. III.1.1.1) sulle aree interne; uno strumento fondamentale per raccogliere informazioni dettagliate e contestualizzate sulle percezioni e le esperienze della comunità locale al di là dei dati oggettivi reperibili. A differenza di metodi più strutturati e numerici, il questionario ha permesso di esplorare aspetti soggettivi e relazionali, offrendo una visione profonda e complessa delle dinamiche territoriali e sociali. I questionari sono stati progettati in modo da stimolare risposte aperte, dando spazio ai partecipanti di esprimere liberamente le proprie opinioni, esigenze e preoccupazioni riguardo il loro ambiente quotidiano.

Questo approccio ha facilitato la raccolta di dati ricchi di significato, permettendo di esplorare non solo i problemi tangibili legati ai servizi o alle infrastrutture, ma anche aspetti più intangibili come il senso di appartenenza, l'impatto delle difficoltà sulla qualità della vita, e la visione del futuro della comunità. Le risposte fornite dai residenti hanno dato un quadro realistico delle problematiche locali, contribuendo a identificare le sfide più urgenti e le opportunità di miglioramento, ma anche a raccogliere idee su come coinvolgere attivamente la popolazione nei processi di cambiamento.

Inoltre, il metodo qualitativo attraverso il questionario ha consentito una certa flessibilità nell'indagine, permettendo ai partecipanti di rispondere con profondità e articolazione, a differenza dei sondaggi chiusi o strutturati. Le informazioni raccolte sono state quindi analizzate in modo tematico, per individuare pattern ricorrenti, preoccupazioni comuni e aspettative condivise, offrendo un importante punto di partenza per l'elaborazione di politiche e interventi che rispondano realmente alle necessità della comunità. Il questionario somministrato si inserisce all'interno del progetto europeo SIAS2 e che mira a rivitalizzare il patrimonio culturale delle aree rurali siciliane (Gadda, 1941). L'obiettivo principale di questa indagine era quello di dare voce direttamente ai cittadini, permettendo loro di esprimere bisogni e aspettative che spesso non emergono attraverso i canali istituzionali tradizionali. La collaborazione con i dottorandi del Dipartimento di Architettura dell'Università degli Studi di Palermo, Alejandro Gana Nunez e Desiree Saladino, dell'ambito urbanistico e sociologico, ha permesso di strutturare il questionario in modo da raccogliere dati rilevanti che potessero fornire un quadro preciso delle dinamiche sociali e territoriali locali.

Il questionario si è concentrato su temi fondamentali come i servizi disponibili, il senso di appartenenza della comunità e le problematiche più critiche che i residenti affrontano quotidianamente. Particolare attenzione è stata dedicata alla comprensione dell'impatto di queste difficoltà sulla vita degli abitanti, in particolare delle fasce più vulnerabili della popolazione, come gli anziani e i disabili, e sulle cause dello spopolamento, che ha determinato una carenza di giovani nella zona. Allo stesso tempo, sono stati esplorati possibili interventi per attrarre nuove risorse, come studenti o associazioni, con l'obiettivo di promuovere lo sviluppo di progetti innovativi che possano rispondere alle sfide territoriali e incentivare la crescita sostenibile del territorio.

Attraverso la raccolta di informazioni dettagliate sui bisogni, le preoccupazioni e le potenzialità delle comunità, il questionario ha rappresentato uno strumento chiave per orientare le amministrazioni locali verso politiche più adeguate e consapevoli delle reali necessità della popolazione. In questo modo, l'iniziativa ha contribuito a rafforzare il legame tra la comunità locale e le istituzioni, ponendo le basi per interventi mirati che possano generare un impatto positivo e duraturo per le aree interne e tenendo in considerazione anche altri questionari già effettuati nell'area negli anni precedenti alla Ricerca (*vedi Scheda Sondaggi Territoriali Madoniti a pag. 225*).

[1] Il progetto europeo SIAS2 - Sicilian Inner Areas Summer School: Valorizing Cultural Heritage through Community Engagement, riconosciuto come Urban Thinker Campus 9.0 da UN-Habitat, si è svolto dal 26 agosto al 2 settembre 2024, coinvolgendo i comuni di Palazzo Adriano, Isnello, Polizzi Generosa e Petralia Sottana. Ideato e coordinato dai dottorandi Samuele Morvillo e Luisa Lombardo dell'Università di Palermo, SIAS2 ha adottato il Design Thinking per valorizzare il patrimonio culturale e promuovere la rigenerazione delle aree interne siciliane. Finanziato dall'Europa Solidarity Corps e supportato da partner locali e internazionali, il progetto ha visto la partecipazione di studenti e ricercatori che hanno lavorato su temi come cultura, turismo, accessibilità e servizi, culminando nella presentazione di progetti concreti per lo sviluppo sostenibile. SIAS2 rappresenta un esempio virtuoso di co-design e innovazione applicata ai contesti territoriali, evidenziando l'importanza del dialogo tra comunità, amministrazioni locali e ricerca accademica.

Struttura del Questionario

Sezione 1: Informazioni personali

Questa sezione ha raccolto i dati anagrafici dei partecipanti, tra cui email, comune di domicilio, comune di nascita, anno di nascita e numero di componenti del nucleo familiare e il livello di istruzione raggiunto, con opzioni che vanno dalla licenza elementare fino alla laurea e oltre. Inoltre, viene chiesto se il partecipante ha frequentato corsi di formazione o aggiornamento professionale negli ultimi 5 anni, e in caso affermativo, di specificarne il nome.
La sezione prosegue con domande sulla condizione lavorativa attuale (occupato, disoccupato in cerca di lavoro, studente, pensionato o altro) e, per chi è occupato, sul settore lavorativo (agricoltura, industria, servizi, pubblica amministrazione o altro).

Sezione 2: Valutazione del territorio

Questa parte è volta a raccogliere opinioni sui servizi del comune di residenza. Vengono chiesti pareri sulla qualità di servizi come sanità, istruzione, trasporto pubblico, servizi sociali e accesso a servizi digitali (connessione internet, pagamenti digitali, ecc.).
I partecipanti devono esprimere il loro grado di soddisfazione rispetto a questi servizi su una scala da molto insoddisfatto a molto soddisfatto.
Viene chiesto se partecipano ad attività culturali locali (regolarmente, occasionalmente o mai) e come valutano il senso di comunità, la valorizzazione del patrimonio culturale, e lo stimolo al turismo nel comune.
La sezione tocca anche l'argomento dell'emigrazione, domandando se i partecipanti hanno mai pensato di lasciare il comune e, in caso affermativo, per quali motivi (lavoro, accesso ai servizi, qualità della vita, motivi familiari, studi, altro).
Altre domande hanno riguardato le risorse ambientali del comune (foreste, parchi, corsi d'acqua, zone agricole) e se ritengono che queste risorse siano adeguatamente tutelate. Viene inoltre richiesto di indicare i principali bisogni del comune (miglioramento dei servizi sanitari, trasporti pubblici, creazione di opportunità di lavoro, ecc.) e di esprimere suggerimenti su come affrontarli.
La sezione si conclude con una valutazione dell'accessibilità dei servizi pubblici per persone con disabilità o anziani, e opinioni su aspetti di decoro urbano come pulizia delle strade, manutenzione delle aree verdi, arredo urbano, gestione dei rifiuti e accessibilità degli edifici pubblici.

Sezione 3: Criticità specifiche e proposte

In questa sezione si indagano le principali criticità riscontrate dai partecipanti nel loro comune, come lo spopolamento, la mancanza di servizi essenziali, la disoccupazione, l'inquinamento e la carenza di infrastrutture.
Come queste criticità influenzano la qualità della vita e quali sono le potenzialità del comune, con opzioni come turismo, agricoltura sostenibile, artigianato locale, patrimonio culturale, innovazione tecnologica.
Se il patrimonio culturale e naturale del comune è adeguatamente valorizzato e, in caso negativo, quali aspetti necessitano di maggiore tutela o promozione.
Il questionario include anche domande sulla conoscenza dei finanziamenti pubblici ricevuti dal comune negli ultimi anni (come PNRR, SNAI o Fondi Regionali) e su come questi siano stati utilizzati, oltre a chiedere suggerimenti su come investire tali risorse per potenziare il territorio.
Infine, si esplorano opinioni sull'apertura della comunità locale all'adozione di nuovi servizi tecnologici (come telemedicina, piattaforme per l'e-commerce, *smart city*, *coworking*, mobilità sostenibile) e sugli eventi culturali più importanti del comune (feste religiose, sagre, carnevale, rappresentazioni teatrali, festival musicali).
Viene chiesto quali tradizioni o usanze locali si sono perse e quali potrebbero essere recuperate, nonché quali cambiamenti i partecipanti vorrebbero vedere nel comune nei prossimi 10 anni.

[1]Mathsly Research. (2020). Scala Likert: approccio statistico. Retrieved September 16, 2024, from https://www.mathsly.it/wordpress/scala-likert/

Metodologia
Il questionario è stato somministrato in formato digitale e cartaceo e comprende una combinazione di domande a risposta chiusa, che consentono di raccogliere dati quantitativi, e domande a risposta aperta, che permettono ai partecipanti di fornire risposte più articolate e qualitative.

È stato strutturato in modo da coprire diversi aspetti della vita comunitaria, dai servizi pubblici alla qualità della vita, fino a questioni di identità culturale e sviluppo economico. Il questionario è stato elaborato per raccogliere informazioni dettagliate sulle percezioni, aspettative e suggerimenti della popolazione locale riguardo le condizioni attuali e future delle aree interne. L'indagine è stata somministrata a un campione di 300 partecipanti, scelti in base a criteri di eterogeneità geografica, sociale ed economica, garantendo una rappresentazione equilibrata di diverse fasce di età, livelli di istruzione e status professionale.

Fasi metodologiche
Definizione degli obiettivi: Il questionario è stato progettato per ottenere dati su tre dimensioni principali:
- **qualità dei servizi essenziali** (sanità, istruzione, trasporti, accesso digitale);
- percezione del territorio (patrimonio culturale, attaccamento alla comunità, opportunità di sviluppo);
- **proposte per il futuro** (soluzioni per contrastare lo spopolamento e migliorare la qualità della vita).

Campionamento: Il campione di 300 partecipanti è stato selezionato considerando diversi gruppi di interesse: residenti permanenti, giovani che hanno lasciato il territorio o che ancora abitano i territori, anziani, professionisti locali, imprenditori, e rappresentanti di istituzioni o associazioni locali. Questo ha garantito una prospettiva diversificata su problemi e potenziali soluzioni.

Somministrazione: Il questionario è stato distribuito sia in formato cartaceo che online, garantendo l'accessibilità a tutti i target demografici, soprattutto a coloro che vivono in aree con scarsa connessione digitale o per analfabetizzazione. È stato condotto un pre-test su un piccolo campione per affinare la formulazione delle domande, assicurando chiarezza e comprensione.

Analisi dei dati: Le risposte sono state raccolte e analizzate utilizzando metodi sia quantitativi che qualitativi. Le risposte chiuse sono state sottoposte ad analisi statistica per individuare tendenze e ricorrenze, mentre le risposte aperte sono state analizzate tramite metodi di analisi del contenuto, per identificare temi ricorrenti e proposte innovative.

Tipologia di domande somministrate
Il questionario è stato strutturato in cinque sezioni principali, ognuna con un mix di domande chiuse (a risposta multipla o su scala Likert[1]) e domande aperte per raccogliere commenti dettagliati e suggerimenti personali.

1. Informazioni personali e demografiche
Questa sezione mirava a raccogliere informazioni di base sui partecipanti per comprenderne il background. Le domande includevano:
- età;
- sesso;
- livello di istruzione;
- occupazione attuale;
- residenza (se il partecipante vive ancora nell'area o si è trasferito).

2. Valutazione dei servizi locali
Domande su scala Likert da 1 a 5 (1 = molto insoddisfatto, 5 = molto soddi-

sfatto) relative alla qualità dei principali servizi nel territorio:
- Sanità e accesso alle cure mediche;
- Istruzione (disponibilità di scuole, qualità dell'insegnamento);
- Trasporti e mobilità (frequenza dei collegamenti, accesso ai mezzi pubblici);
- Accesso ai servizi digitali (copertura internet, velocità della connessione);
- Infrastrutture pubbliche (strade, illuminazione, servizi comunali).

3. Percezione del territorio
In questa sezione i partecipanti sono stati invitati a esprimere il loro livello di accordo (su una scala da 1 a 5) su diverse affermazioni riguardanti il loro attaccamento al territorio e la qualità della vita:
- "Mi sento legato/a alla mia comunità locale."
- "Il patrimonio culturale della mia area è adeguatamente valorizzato."
- "Credo che il mio comune offra opportunità per i giovani."
- "Mi sento sicuro/a di rimanere in quest'area per i prossimi 5 anni."

4. Criticità e sfide
Domande aperte per raccogliere opinioni personali sui problemi principali del territorio:
- Quali sono, secondo lei, le principali criticità del suo comune o dell'area interna in cui vive?
- Cosa pensa stia causando lo spopolamento del suo territorio?
- Quali servizi ritiene essere i più carenti e cosa suggerirebbe per migliorarli?

5. Proposte per il futuro
Questa sezione mirava a raccogliere idee e soluzioni concrete dai partecipanti:
1. "Quali iniziative ritiene potrebbero aiutare a contrastare lo spopolamento?";
2. "Come pensa che il patrimonio culturale e naturale del territorio possa essere meglio valorizzato?";
3. "In che modo giovani e studenti potrebbero essere coinvolti in progetti di sviluppo territoriale?";
4. "Quali fondi o risorse pensa possano essere meglio sfruttati per migliorare i servizi e le infrastrutture?".

Analisi critico interpretativa delle risposte ottenute e scenari
Sezione 1: Informazioni personali
I dati raccolti mostrano una popolazione prevalentemente composta da persone di età superiore ai 50 anni, con una presenza significativa di pensionati e persone in età avanzata nella fascia dei 50 anni in su. La fascia di giovani (18-35 anni) è esigua, con pochi studenti o lavoratori, evidenziando un chiaro fenomeno di spopolamento giovanile. Molti giovani hanno lasciato il comune per motivi di studio principalmente o lavoro, con la maggior parte dei partecipanti più giovani che vive fuori dall'area, in particolare nel palermitano, catanese o messinese, ma mantiene legami con il comune d'origine solo per motivi familiari.

Il livello di istruzione è tendenzialmente medio, con una maggioranza che ha completato la scuola superiore. Solo una minoranza ha frequentato corsi di formazione o aggiornamento professionale negli ultimi 5 anni, indicando una possibile mancanza di opportunità formative sul territorio.

Sezione 2: Valutazione del territorio
La maggioranza dei partecipanti esprime insoddisfazione per i servizi essenziali offerti dal comune. I settori più criticati sono:
- **sanità:** la popolazione anziana lamenta la difficoltà di accesso a servizi

medici e la scarsa presenza di medici specializzati. In particolare, si fa notare l'assenza di strutture adeguate per la cura degli anziani e di servizi di assistenza domiciliare e l'imminente chiusura prevista per l'ospedale Madonita "Madonna SS. dell'Alto";
- **istruzione:** anche se le scuole primarie e secondarie sono valutate positivamente, i giovani trovano limitate le opportunità per l'istruzione superiore o la formazione professionale, costringendo molti a trasferirsi in altre città o in altri paesi, nelle grandi metropoli se si tratta di Università;
- **trasporti:** la mobilità rappresenta una criticità significativa, con trasporti pubblici insufficienti e collegamenti poco frequenti verso le città più grandi. Ciò aggrava l'isolamento del territorio, rendendo difficile per i giovani e le famiglie rimanere nella zona;
- **accesso digitale:** la connessione internet è spesso lenta o inesistente in alcune aree, limitando la possibilità di lavorare a distanza o di accedere ai servizi digitali, nonché promuovere il commercio o il collegamento con il resto del mondo contribuendo alla globalizzazione di queste zone.

Nonostante questi problemi, molti partecipanti mostrano un forte attaccamento alla loro comunità locale e sottolineano l'importanza del senso di comunità e del patrimonio culturale e naturale del territorio. Le attività culturali, anche se limitate, sono apprezzate, ma c'è una sensazione diffusa che la valorizzazione del patrimonio culturale e ambientale sia ancora insufficiente o comunque, il più delle volte, incentivi il turismo mordi e fuggi.

Sezione 3: **Criticità specifiche e proposte**
Le criticità principali identificate dai partecipanti includono:
- **spopolamento:** la mancanza di opportunità lavorative e formative sta spingendo via i giovani, lasciando una popolazione sempre più anziana e riducendo progressivamente la vitalità del territorio. Lo spopolamento porta anche a una riduzione dei servizi;
- **disoccupazione giovanile:** coloro che rimangono, in particolare i giovani, trovano difficoltà a trovare lavoro, specialmente nel settore agricolo e manifatturiero, che tradizionalmente dominano l'economia locale. Alcuni giovani suggeriscono che la mancanza di formazione specifica e di supporto da parte delle istituzioni locali rende difficile lo sviluppo di nuove iniziative imprenditoriali;
- **mancanza di strategie d'area:** i partecipanti sottolineano la carenza di una visione strategica a lungo termine per lo sviluppo del territorio. Sebbene ci siano stati alcuni investimenti pubblici, la loro distribuzione è percepita come inefficace, spesso frammentaria e non rispondente ai bisogni reali.

Proposte progettuali *smart* formulate
Formazione e coinvolgimento dei giovani: Molti partecipanti vedono nelle università e nelle associazioni un'opportunità per rivitalizzare il territorio. Si suggerisce di creare *partnership* con atenei locali, come l'Università di Palermo, per attirare studenti e giovani ricercatori che possano lavorare su progetti legati allo sviluppo sostenibile, alla valorizzazione del patrimonio culturale e all'innovazione tecnologica nonché coadiuvare le amministrazioni in un percorso virtuoso di valorizzazione.
I partecipanti propongono anche l'attivazione di stage e tirocini per studenti, sia a livello universitario che post-diploma, legati alla conservazione del patrimonio storico, al turismo sostenibile, all'agricoltura biologica e all'artigianato locale. In questo modo, i giovani potrebbero acquisire competenze lavorative, creando un collegamento tra formazione e occupazione sul territorio.

Collaborazione con associazioni: Alcuni partecipanti suggeriscono di coinvolgere associazioni giovanili e culturali, sia locali che europee (ad esempio tramite progetti del Corpo Europeo di Solidarietà), per l'organizzazione di eventi e progetti volti a rivitalizzare il territorio. Iniziative come festival cul-

turali, *workshop* di formazione, e progetti di volontariato potrebbero attrarre giovani da tutta Europa, contribuendo alla promozione delle risorse locali e alla creazione di nuovi legami sociali e portare nuovi giovani nel territorio. Un esempio potrebbe essere la realizzazione di laboratori artistici o musicali che utilizzino le tradizioni locali (ad esempio canti popolari, artigianato o cucina tipica) come strumento per creare nuovi contenuti culturali, attraendo così un pubblico giovane e internazionale.

Valorizzazione del patrimonio naturale e culturale: Molti partecipanti ritengono che il territorio abbia potenzialità non sfruttate nel settore turistico. La bellezza naturale delle aree interne, unita al patrimonio storico-architettonico e culturale, potrebbe essere utilizzata come leva per attrarre turisti interessati a esperienze autentiche e sostenibili.
Alcune proposte includono la creazione di percorsi turistici tematici (come itinerari enogastronomici, escursioni naturalistiche, e percorsi storici legati alle tradizioni locali), promuovendo, ad esempio, la conservazione dei muretti a secco, delle masserie storiche e di altre strutture rurali come attrazioni turistiche.

Sfruttamento fondi e risorse esterne: La popolazione evidenzia l'importanza di accedere a nuovi fondi, come quelli offerti dal PNRR e dalla Strategia Nazionale Aree Interne (SNAI). Tuttavia, viene sottolineata la necessità di una gestione più efficiente e strategica di queste risorse e un'attenzione costante alle chiamate europee per una gestione più efficiente dei fondi a disposizione per le aree montane rurali. Gli intervistati suggeriscono che i fondi dovrebbero essere utilizzati non solo per migliorare i servizi essenziali, ma anche per creare un'infrastruttura solida per lo sviluppo economico locale, come l'implementazione di reti digitali e spazi di coworking per giovani imprenditori e lavoratori da remoto.

Lo scenario delineato dal questionario mostra un territorio ricco di potenzialità, ma bloccato da problemi cronici come lo spopolamento e la mancanza di strategie efficaci. Tuttavia, attraverso il coinvolgimento di studenti, giovani e associazioni, e sfruttando in modo più strategico le risorse disponibili, esistono opportunità concrete per invertire la tendenza e rigenerare le aree interne.

Fig. II.2.2.1 | *Somministrazione di questionari ai cittadini ©2024, Luisa Lombardo*

SONDAGGI TERRITORIALI MADONITI

Fig. 1 - Alcuni esiti del Sondaggio effettuato sulle Madonie da Fabrizio Barca nel 2018. ©2018, Forum Diseguaglianze e Diversità

Il Rapporto "Madoniti Emigrati"

Uno degli errori più comuni nei processi di progettazione e decisionali di pianificazione è non considerare chi realmente vive nei territori delle aree oggetto di studio e trasformazione; eppure la comunità è il cuore pulsante di questi territori, dove senza di essa non avrebbe né continuità né futuro. Sulle Madonie, nel 2014, fu l'ex Ministro Fabrizio Barca a promuovere un sondaggio volto a comprendere le reali problematiche dei territori attraverso un approccio partecipativo coinvolgendo una piccola porzione della comunità nel processo decisionale della Strategia per le Aree Interne. Un'indagine socio-economica mirata a comprendere le aspirazioni, i bisogni e i desideri della popolazione dell'area e le condizioni di vita attuali.

Il sondaggio è stato utile per il presente elaborato di tesi al fine di comprendere, oltre ai progetti già affrontati dal 2018 ad oggi con la SNAI, quali possono essere le ulteriori soluzioni da attuare nel territorio madonita; una guida per decidere quanto proporre. Malgrado il sondaggio sia stato fatto su un campione ristretto e sia datato rispetto alla pubblicazione della presente tesi, tuttavia ulteriori analisi hanno riguardato il contatto diretto con la popolazione locale tramite ulteriori contatti e canali.

Il sondaggio effettuato da Barca sulle Madonie è stato un'indagine socio-economica volta a comprendere le condizioni di vita e le aspirazioni della popolazione dell'area. Il sondaggio è stato condotto su un campione di 2.000 persone, rappresentativo della popolazione delle Madonie. I risultati del sondaggio hanno evidenziato una serie di criticità, tra cui:

- un alto tasso di disoccupazione e sottooccupazione, con un'incidenza di queste problematiche particolarmente elevata tra i giovani;
- un basso livello di istruzione, con una quota significativa di popolazione che non ha conseguito il diploma di scuola superiore;
- un'alta incidenza di povertà e disagio sociale;
- un diffuso senso di abbandono e marginalità da parte delle istituzioni.

Il sondaggio ha anche evidenziato alcuni punti di forza, tra cui:

- un forte senso di identità locale e un forte legame con il territorio;
- una forte propensione all'imprenditorialità e alla creatività;
- un'importante risorsa paesaggistica e ambientale.

I risultati del sondaggio hanno avuto un impatto significativo sulla politica di sviluppo delle Madonie. Il Piano Strategico della Regione Siciliana per le Madonie, approvato nel 2017, si è basato sui risultati del sondaggio per definire le priorità di intervento.

Tra gli obiettivi del Piano Strategico figurano:

- la creazione di nuovi posti di lavoro, in particolare per i giovani;
- il miglioramento del livello di istruzione e formazione;
- la riduzione della povertà e del disagio sociale;
- il rafforzamento del senso di appartenenza alla comunità locale.

Il Piano Strategico ha previsto una serie di interventi, tra cui:

- il sostegno all'imprenditoria locale, in particolare nel settore turistico, agricolo e artigianale;
- l'investimento nell'istruzione e nella formazione, con la creazione di nuove scuole e l'offerta di corsi di formazione professionale;
- il potenziamento dei servizi sociali, per contrastare la povertà e il disagio sociale;
- la promozione della cultura e del patrimonio artistico e paesaggistico delle Madonie.

I risultati del sondaggio di Fabrizio Barca hanno contribuito a dare una nuova prospettiva allo sviluppo delle Madonie. Il Piano Strategico, che si basa sui risultati del sondaggio, ha l'obiettivo di trasformare le Madonie in un'area

attrattiva per i giovani, le imprese e i turisti. Ecco alcuni dettagli sui risultati del sondaggio, relativi a specifici aspetti della vita delle Madonie:

- sul fronte occupazionale, il sondaggio ha rilevato che il tasso di disoccupazione è pari al 25%, con un'incidenza particolarmente elevata tra i giovani (35%). Il tasso di sottooccupazione è pari al 20%;
- sul fronte dell'istruzione, il sondaggio ha rilevato che il 30% della popolazione non ha conseguito il diploma di scuola superiore. Il 25% della popolazione ha conseguito il diploma di scuola media superiore. Solo il 25% della popolazione ha conseguito una laurea;
- sul fronte della povertà, il sondaggio ha rilevato che il 20% della popolazione vive in condizioni di povertà assoluta. Il 40% della popolazione vive in condizioni di povertà relativa;
- sul fronte del senso di appartenenza, il sondaggio ha rilevato che il 95% della popolazione si sente fortemente legata alle Madonie.

I risultati hanno fornito una fotografia chiara della situazione delle Madonie. I dati raccolti hanno contribuito a definire le priorità di intervento per lo sviluppo dell'area.

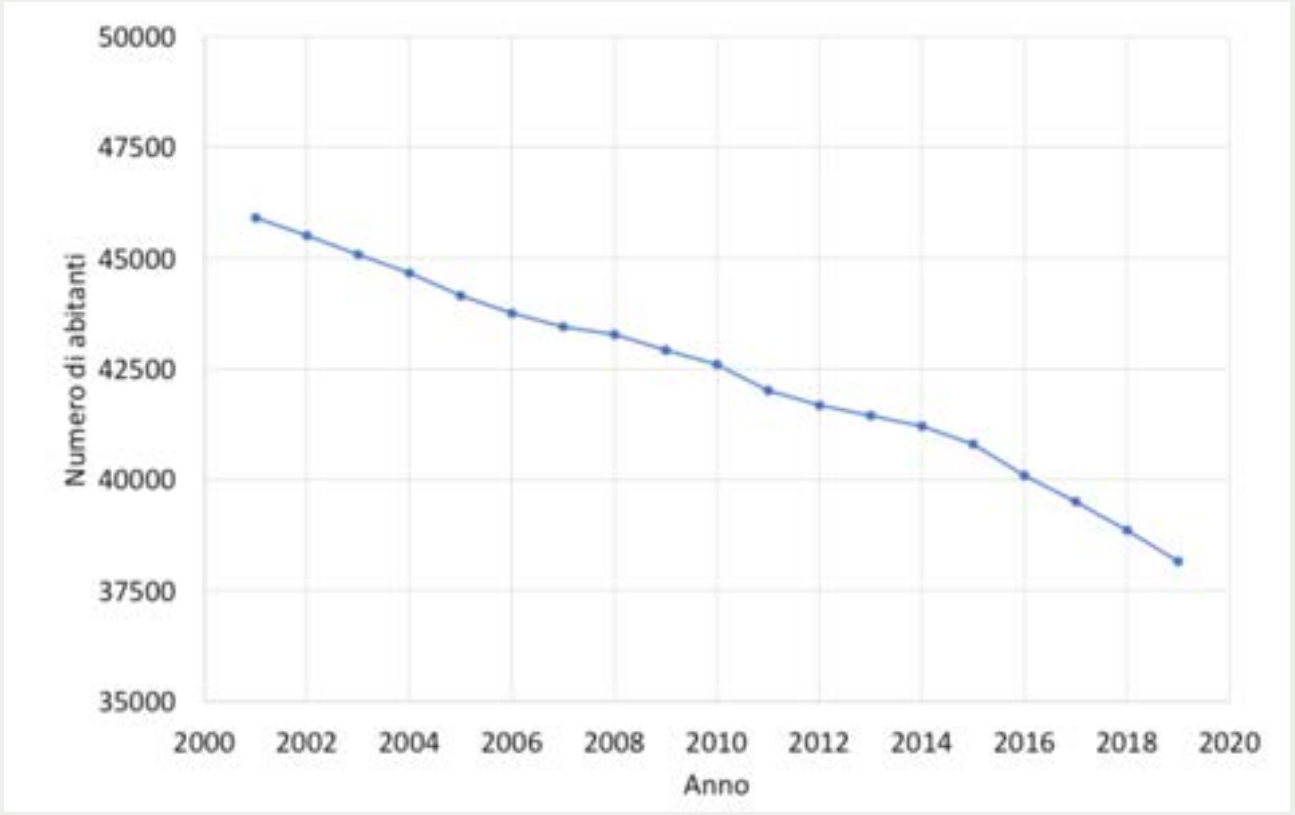


Fig. 2 - Profilo demografico relativo a dodici comuni delle Madonie nel periodo 2001-2019. (Fonte ISTAT), ©Giuseppe Dino, 2019

II.2.3 Il bilancio finale

Le analisi effettuate hanno svolto un ruolo cruciale nell'identificazione delle problematiche presenti nel territorio delle Madonie e nella definizione delle strategie prioritarie per la tutela, la valorizzazione e la promozione di *smart villages* in quest'area. Attraverso questo strumento di analisi, sono stati delineati il quadro esaustivo delle dinamiche e problematiche territoriali, i principali assi di intervento necessari per preservare il patrimonio naturale e culturale delle Madonie, nonché per promuovere uno sviluppo sostenibile che possa beneficiare sia le comunità locali sia i visitatori.

In primo luogo, la valorizzazione del settore primario rappresenta una delle direttrici fondamentali. Le Madonie sono rinomate per la produzione di eccellenza nel campo dell'agricoltura e dell'enogastronomia, con una forte presenza di prodotti *Slow Food* (Minerdo et al., 2022) che incarnano la qualità e la tradizione del territorio contribuendo al 70% della produzione siciliana. L'obiettivo è rafforzare ulteriormente questa vocazione, promuovendo i prodotti locali non solo a livello nazionale, ma anche internazionale, attraverso l'accesso ai mercati globali. Questo richiede un approccio integrato che unisca la tutela delle tradizioni agricole con l'innovazione, per garantire che tali prodotti possano competere su larga scala senza perdere la loro autenticità.

Parallelamente, è necessario migliorare l'offerta turistica, con particolare attenzione alla gestione del patrimonio architettonico e monumentale. Le Madonie sono ricche di storia e cultura, e i loro centri storici, come ad esempio quello di Polizzi Generosa, rappresentano un patrimonio inestimabile che deve essere tutelato e valorizzato. Questo include non solo la conservazione degli edifici storici, ma anche la promozione di un turismo sostenibile che possa apprezzare appieno la bellezza e l'importanza di questi luoghi.

La gestione del patrimonio forestale è un altro elemento cruciale. Le Madonie offrono un ambiente naturale unico, con sentieri e percorsi che attraversano paesaggi mozzafiato. Promuovere l'accessibilità di questi luoghi, attraverso la manutenzione e il miglioramento delle infrastrutture, ma anche dei beni isolati o la punteggiata di architetture esistenti, è essenziale per attrarre visitatori e per garantire che il turismo possa diventare un volano economico per il comprensorio (Lampreu, 2023). A ciò si aggiunge la necessità di promuovere la cultura e le tradizioni locali, rendendole parte integrante dell'esperienza turistica e rafforzando l'identità culturale delle comunità.

Un altro aspetto fondamentale è il miglioramento dei servizi per garantire l'accessibilità dei luoghi, rendendo le Madonie una destinazione attraente e accessibile a tutti. Questo include non solo le infrastrutture fisiche, ma anche l'adozione di un sistema di *governance smart*, capace di garantire un accesso efficiente ai fondi europei e nazionali. L'introduzione di processi di democrazia partecipata, attraverso un approccio *bottom-up*, è essenziale per assicurare che le decisioni riflettano le esigenze e le aspirazioni delle comunità locali.

La sostenibilità è un altro pilastro della strategia, con l'obiettivo di migliorare il comfort indoor e outdoor del patrimonio edilizio (D'Ambrosio Alfano et al., 2020). Questo richiede interventi di efficientamento energetico, adeguamento strutturale e la costituzione di comunità energetiche, per garantire che gli edifici siano non solo sicuri e confortevoli, ma anche sostenibili dal punto di vista ambientale.

In quest'ottica, la tutela dei centri storici (Malo, 2020) nelle Madonie assume un ruolo centrale. La protezione del patrimonio naturale è stata già affrontata con successo, come dimostrato dall'inclusione del Geopark UNESCO delle Madonie. Ora, l'attenzione si sposta sulla salvaguardia del patrimonio costruito volta a ripopolare il territorio, che rappresenta un testimone insostituibile della storia e della cultura locale e che risulta presente in tutte le dinamiche territoriali svolgendo un ruolo più che fondamentale nella rinascita del comprensorio. I centri storici delle Madonie non sono semplicemente luoghi abitati, ma veri e propri musei a cielo aperto che rac-

contano la storia di secoli di insediamenti umani, influenze culturali diverse e architetture uniche. La loro tutela è cruciale non solo per preservare la memoria storica, ma anche per garantire che questi luoghi possano essere goduti dalle generazioni future.

Fig. II.2.3.1 | *Mikhail Albano a Bompietro, Italy ©2022, IArtMadonie*

II.3 L'esperienza di Ricerca presso la Soprintendenza BB.CC.AA. della Provincia di Palermo

Un caso studio significativo, in questo contesto, è il paese di Polizzi Generosa, caso scelto in sinergia con la Soprintendenza BB.CC.AA. della Prov. di Palermo. Questo piccolo centro abitato, con le sue strade strette e tortuose, piazze storiche e chiese antiche, rappresenta un esempio di come la conservazione del patrimonio costruito possa andare di pari passo con lo sviluppo sostenibile. Polizzi Generosa è non solo un simbolo della ricchezza storica e culturale della Sicilia, ma anche un caso pilota di come la tutela del patrimonio edilizio possa contribuire all'attrattività turistica e al benessere economico della comunità locale, ecco perchè l'analisi ha preso spunto a partire da questo paese con la sinergia della Soprintendenza ai Beni Culturali e Ambientali della Provincia di Palermo.

In questo contesto normativo, la Legge Regionale Siciliana del 10 luglio 2015, n. 13, denominata "Norme per favorire il recupero del patrimonio edilizio di base dei centri storici", rappresenta un quadro legislativo fondamentale per promuovere la riqualificazione dei centri storici siciliani. Questa legge mira a incentivare il recupero degli edifici storici, attraverso misure che agevolano la ristrutturazione e la valorizzazione del patrimonio edilizio esistente, evitando così l'abbandono e il degrado che minacciano molti borghi storici. Le disposizioni della legge puntano a salvaguardare le caratteristiche architettoniche e storiche degli edifici, promuovendo al contempo l'efficienza energetica e l'adeguamento strutturale necessario per garantire la sicurezza e il comfort abitativo.

La successiva Legge Regionale 24 dicembre 2018, n. 24, che introduce modifiche alla legge del 2015, ha ulteriormente rafforzato queste misure, ampliando le possibilità di intervento e semplificando le procedure per il recupero del patrimonio edilizio. Le modifiche apportate mirano a rendere più efficaci gli strumenti normativi a disposizione delle amministrazioni locali e dei privati, incentivando ulteriormente il recupero e la valorizzazione dei centri storici, con particolare attenzione alle esigenze di conservazione e alla promozione di interventi sostenibili e con manuali e prontuari tecnici volti a supporto dell'attuale PRG vigente dei comuni.

Infine, ma non per importanza, ogni territorio all'interno delle Madonie deve essere in grado di individuare il proprio *genius loci*, ovvero la propria vocazione territoriale unica. Questo concetto implica la capacità di sfruttare al meglio le specificità e le risorse locali, adattando le strategie di sviluppo alle caratteristiche peculiari di ogni area, per garantire un futuro sostenibile e prospero per tutte le comunità delle Madonie.

La tutela e la valorizzazione delle Madonie devono seguire un percorso ben delineato che integri la conservazione del patrimonio naturale e culturale con lo sviluppo economico sostenibile. Attraverso un approccio olistico che coinvolga tutti gli attori del territorio, è possibile garantire che le Madonie non solo preservino la loro identità unica, ma diventino anche un modello di sviluppo sostenibile per altre aree rurali e montane.

La metodologia proposta per lo sviluppo di un villaggio intelligente (*smart*) si articola in diverse fasi strategiche. Inizialmente, viene condotta un'analisi SWOT per valutare i piccoli centri nonché i punti di forza, le debolezze, le opportunità e le minacce del contesto territoriale. Successiva-

mente, si stabilisce un contatto diretto con il territorio tramite una serie di sopralluoghi conoscitivi e campagne fotografiche, utili per approfondire la conoscenza delle specificità locali. Viene poi effettuata l'individuazione degli assi di punta, cioè i settori produttivi maggiormente sviluppati, e i servizi e la *governance* territoriale rilevanti. Si passa quindi alla pianificazione degli interventi di recupero architettonico e di efficientamento energetico, al fine di migliorare la qualità della vita e assicurare alti standard di sostenibilità. Una parte fondamentale del processo è la valutazione del *genius loci* e della vocazione territoriale, che orientano le strategie di recupero e valorizzazione.

Il piano di lavoro prevede un approccio duplice: da un lato, interventi specifici per il villaggio selezionato; dall'altro, una visione d'insieme per l'intero comprensorio territoriale, al fine di uniformare il territorio a criteri di innovazione e sostenibilità, ma soprattutto compatibili. Viene infine proposto un sistema di linee guida che integra tradizione e innovazione, con un atlante strategico che descrive le politiche e le soluzioni *smart* puntuali applicabili.

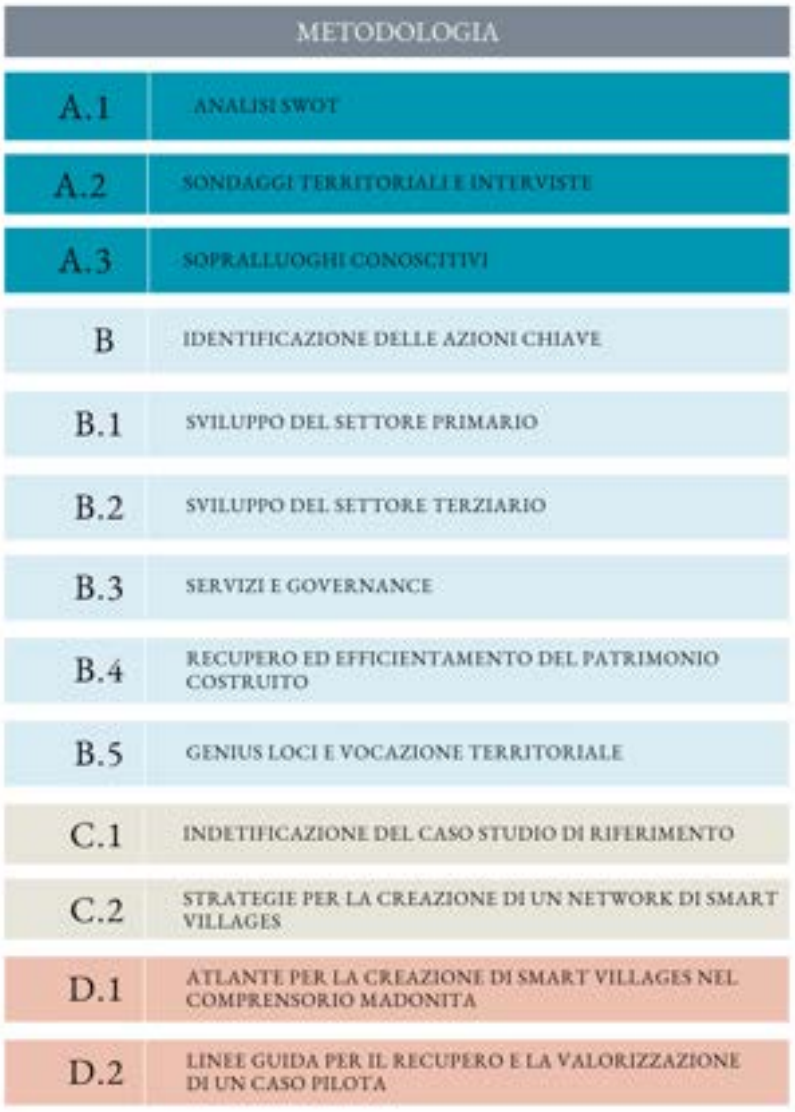


Fig. II.3.1 | Metodologia per individuare gli output della Ricerca ©Luisa Lombardo, 2024

II.3.1 Il Comune di Polizzi Generosa

La selezione di Polizzi Generosa come caso studio si inserisce, come già accennato, in un contesto di collaborazione approfondita con la Soprintendenza ai Beni Culturali e Ambientali di Palermo, un Ente fondamentale nella conservazione e valorizzazione del patrimonio storico, artistico e culturale siciliano. La *partnership* con questa Istituzione ha giocato un ruolo cruciale nella scelta di Polizzi Generosa come caso studio. La collaborazione ha permesso di approfondire la conoscenza del territorio, arricchendo significativamente l'analisi del caso studio.

Polizzi Generosa è un comune di grande interesse storico e culturale, frutto di secoli di evoluzione e stratificazioni (Salamone, 1987). Il centro storico, parzialmente ben conservato, è un autentico esempio di borgo medievale, con stradine tortuose, abitazioni in pietra e portali finemente decorati. Tra i principali monumenti spiccano la maestosa chiesa madre, il convento dei Cappuccini, il sontuoso palazzo baronale e il caratteristico teatro Politeama. La storia di Polizzi Generosa è un viaggio attraverso le civiltà che l'hanno attraversata, dai Sicani ai Romani, dagli Arabi agli Svevi, dagli Angioini agli Aragonesi, fino ai Borboni. Nel XVI secolo, il comune divenne feudo delle influenti famiglie Moncada, Branciforti e Filangieri, testimoniando l'importanza strategica e culturale del territorio (Salamone, 1987).

Il legame tra Polizzi Generosa e la sua identità locale è un elemento centrale nell'analisi. Il comune è fortemente impegnato nella preservazione e promozione del suo patrimonio culturale, con particolare attenzione all'ambiente circostante e alla valorizzazione delle attività culturali, naturalistiche e turistiche. La collaborazione con la Soprintendenza ha permesso di approfondire il modo in cui la comunità preserva e valorizza il suo retaggio culturale e ambientale.

Situato nelle Alte Madonie, a circa 80 km a nord-ovest di Palermo, Polizzi Generosa è una zona ultraperiferica, come definita nella strategia SNAI. La rete viaria del comune, pur non essendo attraversata da autostrade, comprende strade statali, provinciali e comunali che garantiscono una connettività medio-bassa, ma sufficientemente efficace per favorire uno sviluppo economico e sociale graduale. La Strada Statale 120, la "Strada dei Quattro Parchi Siciliani", collega Polizzi Generosa a Palermo e Catania ed è uno degli snodi fondamentali del comune. Tra le strade provinciali, la SP118 facilita l'interscambio con Castellana Sicula, mentre la SP119 è cruciale per il turismo montano, collegando il comune al rilievo della Mufara, sede della località sciistica di Piano Battaglia (Anselmo, 2016).

La consultazione di pratiche e progetti e la valutazione delle criticità riscontrate dalla Soprintendenza nonché la somministrazione di documentazione sui beni monumentali tutelati, ha fornito un apporto fondamentale per comprendere possibili dinamiche da intraprendere di concerto.

Polizzi Generosa ha una storia millenaria, segnata dall'insediamento di diverse popolazioni che hanno lasciato tracce indelebili nel territorio (Albanese, 2018). La sua condizione di città demaniale ha attratto numerose famiglie nobiliari che, nel corso dei secoli, hanno arricchito il patrimonio urbano e culturale del borgo. Nonostante le sue dimensioni contenute custodisce un patrimonio artistico straordinario, con chiese, palazzi e musei che raccontano la sua storia. Un tempo, oltre 72 chiese arricchivano il suo tessuto urbano. Il tessuto urbano ha mantenuto la sua struttura originaria, con vicoli e strade che trasportano il visitatore nel passato, arricchendo l'esperienza di chi lo esplora (Macaluso, 2022).

Il comune vanta anche una ricca varietà di risorse naturali, che giocano un ruolo cruciale nella sua identità e nello sviluppo del territorio. L'acqua, proveniente da numerose sorgenti, è fondamentale per l'approvvigionamento idrico e l'irrigazione agricola, supportando l'agricoltura locale e preservando il paesaggio rurale tradizionale. Le foreste circostanti, ricche di querce, castagni e faggi, offrono legna e prodotti forestali non legnosi, contribuendo all'economia locale e alla protezione ambientale. I giacimenti minerari di calcare, argilla e gesso supportano l'industria edilizia, mentre la

fauna selvatica, tra cui cinghiali e cervi, alimenta la tradizione venatoria e il turismo naturalistico (Gennuso, 2019). Il paesaggio montano, con i suoi panorami mozzafiato, è una risorsa turistica crescente per escursioni e attività all'aria aperta. Settori come il turismo, l'agricoltura, l'allevamento e l'artigianato, strettamente legati alla tradizione locale, contribuiscono all'economia e alla valorizzazione dell'identità culturale.

La scelta di Polizzi Generosa come caso studio è rafforzata dalla sua posizione geografica, situata nelle Alte Madonie per la sua inaccessibilità dovuta all'orografia, e dal suo impegno nella rigenerazione urbana e nella conservazione del patrimonio, che la rendono uno dei comuni più virtuosi del comprensorio come, infatti, definito nel Cap. I è uno dei quattro comuni madoniti ad aver finanziato un progetto del PNRR (Macaluso, 2022). Il progetto di valorizzazione è supportato anche dalla Convenzione con il Dipartimento di Architettura dell'Università di Palermo, che ha creato le condizioni ideali per un laboratorio di laurea dedicato alla tutela e valorizzazione del borgo. Inoltre, il Dipartimento, in particolare il settore CEAR-08/A, è un partner chiave del progetto PNRR.

La storia di Polizzi Generosa è oggetto di dibattito tra studiosi (Lavanco, 2019). Alcuni suggeriscono che il nome possa derivare dalla città di Polis, altri lo collegano agli dei Palici. L'ipotesi che il nome derivi da "Polis Isidis", cioè Città di Iside, è avvalorata dal ritrovamento di una statua di Iside. La città ha origini bizantine, fu successivamente conquistata dai Saraceni e infine dai Normanni, che ne avviarono un periodo di prosperità. La sua successiva appartenenza ai Normanni, Svevi, Angioini e Aragoneti ha lasciato tracce profonde nel patrimonio storico-artistico, rendendo Polizzi Generosa un esempio unico di continuità culturale nel corso dei secoli (Curatolo, 2019).

Il progetto del PNRR intitolato "G.A. Borgese Genius Loci. Alla scoperta del territorio e delle tradizioni" mira alla rigenerazione di Polizzi Generosa attraverso la valorizzazione del patrimonio culturale e naturale. Con un budget complessivo di 20 milioni di euro, di cui 17,5 milioni finanziati dal PNRR e 2,5 milioni dal Comune, prevede la riqualificazione del patrimonio storico-architettonico, lo sviluppo di nuove attività culturali e turistiche, e il rilancio delle attività produttive locali.

L'analisi delle pratiche adottate dal comune ha messo in evidenza sia gli aspetti positivi che le criticità, con particolare attenzione alla vivace organizzazione di manifestazioni durante l'anno, che ha contribuito a rendere Polizzi Generosa, oggi, un importante attrattore turistico grazie alla sua tradizione e al valore storico-artistico del territorio. Il comune ha anche partecipato con successo a progetti come del Fondo Ambiente Italiano "I luoghi del cuore" e il progetto "Borghi dei Tesori", volti al recupero e alla valorizzazione del patrimonio architettonico monumentale (Anselmo, 2021).

Per approfondire la conoscenza di Polizzi Generosa sono state effettuate campagne fotografiche e delle analisi rispetto alla tradizione costruttiva e al patrimonio costruito coinvolgendo gli abitanti locali per comprendere meglio le loro esigenze e necessità.

L'attenzione si è concentrata sulla catalogazione delle peculiarità territoriali, con l'obiettivo di rendere i dati facilmente comprensibili e sistematizzabili. Le schede che seguono comprendono un inquadramento dettagliato del territorio, l'analisi dei dati reperibili dal sito ISTAT, le condizioni geografiche e climatiche, la viabilità, le risorse naturali presenti, i beni architettonici catalogati dalla Soprintendenza, il progetto del PNRR, e infine, un'analisi SWOT parziale, che sintetizza le principali criticità e opportunità del territorio. Quest'approccio ha permesso di ottenere una visione chiara e organizzata delle risorse e dei punti di forza, agevolando una pianificazione efficace per lo sviluppo sostenibile del comune.

Fig. II.3.1.1 | Via Giuseppe Garibali, Polizzi Generosa ©Polizzi Generosa: un ecomuseo da vivere e scoprire, 2023

Fig. II.3.1.2 | Maretta a Polizzi Generosa ©Luigi Parisi, 2023

INQUADRAMENTO TERRITORIALE

Polizzi Generosa è un comune situato nel cuore delle Madonie, un'area montuosa della Sicilia nord-occidentale, nella provincia di Palermo. Si trova a un'altitudine di circa 917 metri sul livello del mare, il che gli conferisce un panorama suggestivo e una posizione dominante sulla valle dell'Imera settentrionale. Geograficamente, è inserito all'interno del Parco delle Madonie, una riserva naturale di grande valore ambientale, caratterizzata da una biodiversità eccezionale e paesaggi ricchi di flora e fauna uniche.

La vicinanza a importanti arterie stradali e alla costa settentrionale siciliana fa di Polizzi Generosa un nodo strategico per chi desidera esplorare le bellezze naturali e culturali della regione.

Fig. II.3.1.3 | Polizzi Generosa dal satellite ©Google Maps, 2024

Fig. II.3.1.4 | Polizzi Generosa dal drone © Carmelo Di Salvo, 2021

Fig. II.3.1.5 | Planimetria di Polizzi Generosa ©Luisa Lombardo, 2023

ABITANTI

2.913 (31 dicembre 2022)

ALTITUDINE

920 m s.l.m.
minima: 362
massima: 1.869

COORDINATE GEOGRAFICHE

sistema sessagesimale
37° 48′ 46,44″ N
14° 0′ 15,12″ E

sistema decimale
37,8129° N
14,0042° E

CLASSIFICAZIONE SISMICA

Zone sismica 2

Zona dove possono verificarsi forti terremoti.

CLASSIFICAZIONE CLIMATICA DI MARCIANA

Zona climatica D

Periodo di accensione degli impianti termici: dal 1 novembre al 15 aprile (12 ore giornaliere), salvo ampliamenti disposti dal Sindaco.

Gradi-giorno 2.037

Il grado-giorno (GG) di una località è l'unità di misura che stima il fabbisogno energetico necessario per mantenere un clima confortevole nelle abitazioni. Rappresenta la somma, estesa a tutti i giorni di un periodo annuale convenzionale di riscaldamento, degli incrementi medi giornalieri di temperatura necessari per raggiungere la soglia di 20 °C.
Più alto è il valore del GG e maggiore è la necessità di tenere acceso l'impianto termico.

TEMPERATURE

La temperatura in genere va da 5 °C a 28 °C ed è raramente inferiore a 2 °C o superiore a 31 °C

DATI DEMOGRAFICI	
Popolazione totale, densità abitativa	Circa 2.913 abitanti (2022); Densità: 21 ab/km^2
Età media, distribuzione per età	Età media alta; maggioranza di popolazione anziana, con una crescente diminuzione di giovani
Tendenze migratorie	Emigrazione superiore all'immigrazione, saldo migratorio negativo
Tasso di natalità e mortalità	Tasso di natalità basso (21 nascite, 56 decessi nel 2022)
ECONOMIA LOCALE	
Settori economici predominanti	Agricoltura, allevamento, turismo, industria mineraria
Occupazione e disoccupazione	Disoccupazione in aumento, con ridotte opportunità per giovani
Presenza di imprese locali e start-up	Piccole imprese artigianali, agriturismi; scarsità di start-up
Iniziative di innovazione e digitalizzazione	Iniziali tentativi di digitalizzazione e innovazione in agricoltura e turismo
INFRASTRUTTURE E TRASPORTI	
Accessibilità stradale, ferroviaria	Rete stradale ben collegata, assenza di ferrovie dirette; accesso via strade provinciali e statali
Condizioni delle infrastrutture	Strade provinciali in buono stato; manutenzione richiesta per alcune arterie locali
Rete di trasporti pubblici e privati	Limitata; la maggior parte dei trasporti è privata
Connessioni digitali	Presente banda larga (fibra e wirelesse), connessioni in via di miglioramento
SERVIZI PUBBLICI E SOCIALI	
Strutture sanitarie, scuole	Strutture sanitarie limitate; presenza di scuole primarie e secondarie
Servizi per anziani e giovani	Centri di assistenza e ricreativi per anziani; mancanza di servizi avanzati per giovani
Sicurezza pubblica e protezione civile	Livello di sicurezza medio-alto; Protezione civile ben organizzata
PATRIMONIO CULTURALE E STORICO	
Monumenti, musei, tradizioni locali	Ricca di patrimonio monumentale e tradizioni, di feste religiose e sagre
Eventi culturali e ricreativi	Festival culturali e sagre locali
Valorizzazione del patrimonio	Attenzione crescente verso il recupero del patrimonio artistico e storico, soprattutto per la riqualificazione di edifici

TURISMO E TEMPO LIBERO

Offerta turistica	Turismo culturale, naturalistico, enogastronomico (Verbumcaudo)
Strutture ricettive	Agriturismi, B&B, hotel, masserie e numerose strutture per turismo naturalistico
Attività ricreative	Trekking, escursionismo, attività naturalistiche

SOSTENIBILITÀ AMBIENTALE

Gestione delle risorse naturali	Modesta gestione idrica; scarsa quantità di progetti per valorizzare le risorse forestali e minerarie
Politiche ambientali	Politiche di tutela ambientale in collaborazione con il Parco delle Madonie
Presenza di parchi naturali	Parte del Parco delle Madonie e diverse aree protette in Tutela 1 e 2

STRUTTURA SOCIALE E PARTECIPAZIONE

ONG e associazioni di volontariato	Attiva partecipazione delle associazioni locali in progetti sociali e culturali
Partecipazione dei cittadini	Coinvolgimento limitato dei cittadini nelle decisioni locali tramite assemblee
Coesione sociale	Modesto livello di coesione sociale e identità comunitaria

INNOVAZIONE TECNOLOGICA

Iniziative smart city	Progetti iniziali di illuminazione intelligente e ottima gestione rifiuti (AMA Rifiuto è Risorsa)
Presenza di tecnologie IoT	Applicazioni molto limitate; pochi progetti in fase di sviluppo
Progetti di sviluppo sostenibile	Progetti per migliorare l'efficienza energetica con fondi del PNRR (Vicolo Cilluffo)

POLITICHE DI SVILUPPO E GOVERNANCE

Politiche pubbliche locali	Programmi di sviluppo turistico e agricolo; piani per migliorare le infrastrutture viarie
Disponibilità di fondi	Alcuni finanziamenti europei per progetti di recupero architettonico e sviluppo sostenibile (es. PNRR)
Collaborazioni pubblico-private	Collaborazioni con enti locali (So.Svi.Ma), Università, enti regionali e buona sinergia con il Parco delle Madonie

Fig. II.3.1.6 | Il fenomeno della maretta a Polizzi Generosa ©Luisa Lombardo, 2023

VIABILITÀ TERRITORIALE E LOCALE

Strade Statali	**SS120** - Strada Statale 120 (Etna e Madonie) [Palermo, Catania] Collegamento con le principali città siciliane, supporto ai flussi turistici e accesso a risorse locali.
Strade Provinciali	**SP118** - [Polizzi Generosa, Castellana Sicula] Rafforza connettività e interscambio economico e sociale **SP119** - [Polizzi Generosa, Piano Battaglia] Favorisce il turismo sciistico e naturalistico **SP120** - [Polizzi Generosa, Petralia Soprana] Supporto a scambi commerciali e culturali **SP121** - [Polizzi Generosa, Gangi] Rafforza cooperazione territoriale e culturale
Strade Comunali	**SC1** - [Polizzi Generosa, Piano Pomo] Accesso a aree naturalistiche e agricole **SC2** - [Polizzi Generosa, San Giovanni] Favorisce lo sviluppo economico locale **SC3** - [Polizzi Generosa, Portella del Vento] Riduce l'isolamento delle frazioni più distanti

RISORSE NATURALI

Acqua	Numerose sorgenti d'acqua, inclusa quella del fiume Pollina
Foreste	Parco delle Madonie e ricca varietà Mediterranea; Boschi di querce, castagni e faggi
Risorse minerarie	Giacimenti di calcare, argilla e gesso
Fauna selvatica	Cinghiali, cervi, volpi, conigli
Paesaggio montano	Tutelato (Geopark UNESCO) e ricco di sentieri escursionistici
Agricoltura	Coltivazione di prodotti tipici, sostenuta da risorse idriche abbondanti e suolo fertile
Allevamento	Praticato con metodi tradizionali
Artigianato	Lavorazione del legno, ferro e ceramica

Fig. II.3.1.7 | Archi dell'antico Acquedotto stile Romano del 1817 di Polizzi Generosa ©Carmelo Di Salvo, 2023

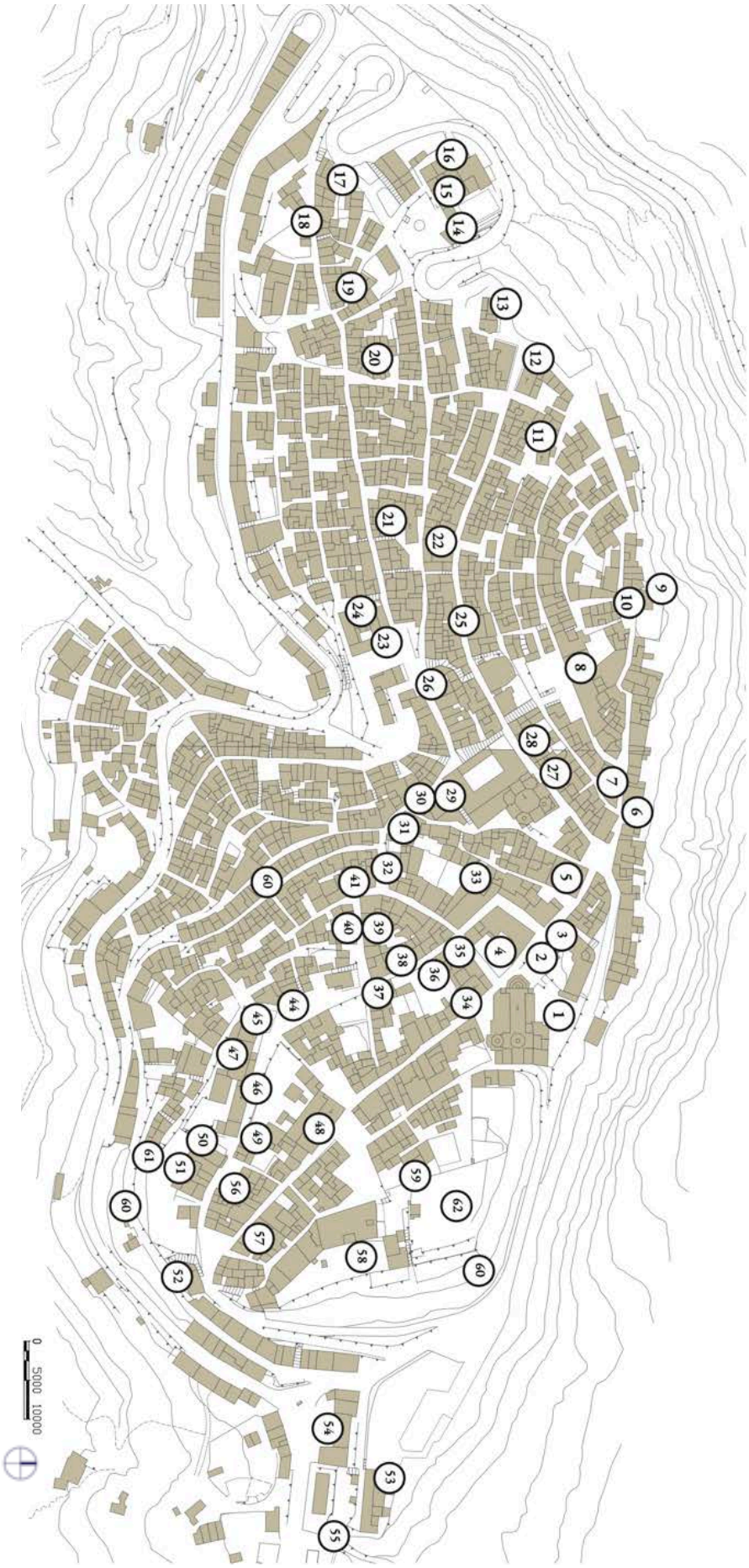


Fig. II.3.1.8 | *Fonte: Scheda dei beni censiti dalla Soprintendenza BB.CC.AA. della Provincia di Palermo*

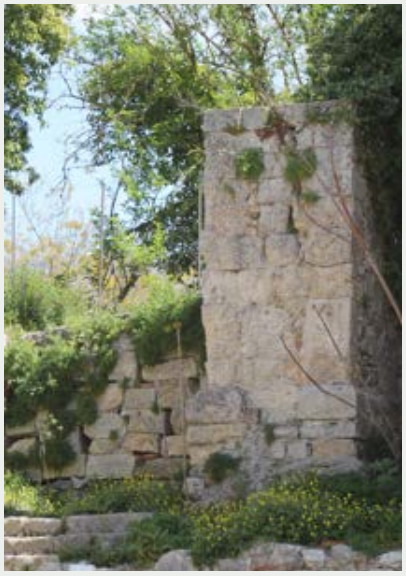


Fig. II.3.1.9 | Ruderi del Castello di Polizzi Generosa ©Luisa Lombardo, 2023

Fig. II.3.1.10 | Chiesa del Carmine a Polizzi Generosa ©Luisa Lombardo, 2023

ELENCO DEI BENI CENSITI DALLA SOPRINTENDENZA BB.CC.AA. DELLA PROVINCIA DI PALERMO

1. Chiesa Madre (Beata Vergine Assunta), 1690 (sui precedenti impianti minori del 1083; portico laterale del 1486-1521, portale del 1700)
2. Chiesa della SS. Trinità (già Chiesa madre) dall'ordine dei religiosi cavalieri di S. Maria dei Teutoni, 1303
3. Ex Ospedale della SS. Trinità (poi della SS. Annunziata), 1400 (su precedente impianto del sex XIV o precedente; dal 1591 al 1866 Ospedale dei Frati Fatebenefratelli di S. Giovanni di Dio; demolito)
4. Palazzo La Farina (poi Gugliano - Porcara), sec. XVI
5. Palazzo Rampolla - Caracciolo sec. XVIII (resti di facciata e delle strutture murarie interne)
6. Ex Chiesa della Madonna dell'Odigitria 1589 (chiusa al celto nel 1892, oggi inglobata in costruzioni recenti)
7. Palazzo Sponselli, sec. XVII (resti)
8. Palazzo Gagliardi Barone di Carpinello della Regia Secrezia, sec. XVII
9. Chiesa di S. Pancrazio, 1570, fu capo di capitaneria centro spirituale dei Bizantini sino a tutto il sec. XVI. Non è databile, ma probabilmente è anteriore all'occupazione Araba (ampliamenti del 1611; oggi abbandonata)
10. Torre, sec. XVI (su precedente impianto)
11. Chiesa di S. Giorgio chiamata dal '700 dell'Udienza. Fu capo di capitaneria, sec XVII (su precedente impianto: rito greco)
12. Chiesa di S. Maria Lo Piano (o di Gesù o del Soccorso) esistente prima del 1301 (rimaneggiamenti del sec. XVIII e successivi)
13. Chiesa della SS. Trinità dell'Ordine dei Religiosi Cavalieri di S. Maria dei Teutoni, 1303 (sconsacrata, oggi garage)
14. Oratorio del SS. Rosario, 1555 (parzialmente demolita)
15. Chiesa di S. Spirito, inizi del sec. XV (parzialmente crollata), annessa al convento dei Domenicani e oratorio della Madonna del Rosario. Il convento fu costruito nel 1496 accanto alla chiesa che già esisteca; l'oratorio è del 1555
16. Convento dei PP. Domenicani, 1469-1549 (dismesso, manomissioni e trasformazioni d'uso recenti)
17. Ex Chiesa del SS. Salvatore, 1554 (rudere del sec. XIX sostituita da edilizia abitativa del sec. XX)
18. Ex Chiesa di S. Biagio, sec. XIII (demolita nel 1838)
19. Chiesa di S. Antonio Apostolo, 1361 (su precedente impianto arabo; trasformazioni del sec. XVII)
20. Chiesa di S. Maria degli Schiavi (o della Porta), 1672 (su precedente impanto)
21. Chiesa di S. Orsola 1570 (sul precedenre impianto minore della chiesa di S. Maria di Presti Michele del 1386)
22. Palazzo Signorile, 1885 (su precedente impianto)
23. Chiesa di Maria di Gesù (o di S. Maria degli Angeli, 1661)
24. Ex convento dei Frati Minori Osservanti, 1661 (dismesso; dal 1913 Ospedale civico, demolito e ricostruito)
25. Convento di S. Giovanni Apostolo, (dismesso, oggi esercizio commerciale)
26. Palazzo Porcaro, sec. XVIII
27. Chiesa di S. Girolamo, 1681-1730 (col titolo di San Domenico dal 1767 al 1805)
28. Collegio dei PP. Gesuiti, 1681-1730 (dal 1767 al 1805 dei PP, Domenicani, dal 1805 al 1866 ancora dei PP. Gesuiti; oggi Municipio)
29. Chiesa di S. Caterina, 1750
30. Orfanotrio di S. Caterina (o Badia Piccola), inizi del sec. XVII (dismesso nel 1786)
31. Palazzo signorile, sec, XVIII
32. Palazzo Porcaro, sec, XIX
33. Palazzo signorile, sec. XVIII

Fig. II.3.1.11 | Chiesa di Santa Maria Gesù Lo Piano a Polizzi Generosa ©Luisa Lombardo, 2023

Fig. II.3.1.12 | Chiesa di Sant'Orsola a Polizzi Generosa ©Luisa Lombardo, 2023

Fig. II.3.1.13 | Palazzo Signorile ©Luisa Lombardo, 2023

34. Chiesa di S. Gandolfo (detta La Povera), 1622 (sui precedenti impianti della Chiesa e dell'Ospedale di S, Cecilia esistenti nel 1386)
35. Collegio di Maria, 1786 (sul precedente impianto della "Casa del Vescovo" del sec, XVII-XVIII; dal 1913 diretto dalle Suore Missionarie Francescane del Bambino Gesù)
36. Resti di balcone, sec. XV
37. Resti di portale, sec, XVIII
38. Chiesa di S. Maria delle Grazie, fine del sec, XV (rimaneggiamenti del 1793)
39. Monastero delle suore Benedettine di S. Maria delle Grazie (detto Badia Grande), 1499 (sui precedenti impianti della Chiesa di S, Mattéa e del Palazzo Signorino)
40. Palazzo signorile, sec. XVIII (resti)
41. Resti di Portale, sec. XVI
42. Ex Chiesa di S. Maria Maddalena, 1315-1386 (dal 1558 aggiunto il titolo di S, Giovanni Battista; demolita nel 1892 per la costruzione della carrozzabile Collesano-Polizzi)
43. Chiesa di S. Agostino (già S Giovanni B,del Ponte), sec. XIII (dal 1580 Commenda della Camera Magistrale del Priorato di Messina dei Cav. di Malta, dismessa nel 1866, rudere)
44. Palazzo Fatta, sec. XVIII
45. Chiesa di S. Nicolò dei Franchi, 1167 (rimaneggiamenti del sec. XVI; già annessi Ospedale e Ospizio omonimi, poi inglobati nel Monastero di S, Margherita)
46. Chiesa di S. Margherita, sec, XVII (su precedente impianto)
47. Ex Monastero di S. Margherita delle Suore Benedettine, 1323-1327 (demolito e sostituito da edilizia del sec, XX)
48. Chiesa di S. Francesco d'Assisi, sec, XIV (restauri recenti)
49. Convento dei Frati minori Conventuali di S. Francesco, sec. XIV (dismesso nel 1860)
50. Chiesa di Maria SS. Annunziata, sec. XV (in rovina)
51. Ex Convento dei FF. Minori Cappuccini, 1644 (dismesso nel 1866, demolito e sostituito da edilizia abitativa del sec, XX)
52. Ex Chiesa della Madonna delle Grazie, inizi del sec, XVI (ricostruita nel 1618; demolita nel sec. XX)
53. Chiesa della Madonna della Misericordia (poi della Madonna del Carmelo), sec. XV (rimaneggiamenti dei secc, successivi)
54. Ospedale di S. Giuliano e Convento dei PP. Domenicani, 1420 (dal 1549 dei PP, Carmelitani Riformati di Monte Santo; demolizioni parziali e rifacimenti del sec, XX)
55. Acquedotto, 1476-1480 (resti)
56. Ex Chiesa (demolita)
57. Palazzo Maretta Barone di S. Agata (poi Migliozzi Dagnino), sec. XVIII (su precedente impianto)
58. Palazzo Gagliardo di Casalpietro, sec, XVII
59. Ex Chiesa della Madonna del Castello (chiusa al culto nel 1897; sconsacrata nel 1918, oggi ruderi)
60. Mura di Città, sec, VII-XI (rimaneggiamenti del sec. XIV)
61. Ex Porta Grande (demolita)
62. Castello di Ruggero, sec. XII (resti delle torri quadrangolari e della cortina muraria perimetrale)

EVENTI E CENNI STORICI

Origini Antiche	Diverse ipotesi sulle origini: potrebbe corrispondere all'Atene siciliana, ai superstiti di Palica o derivare da "Polis Isidis" (Città di Iside).
Dominazione Bizantina	La città fu fortificata dai Bizantini, con lo scopo di difendersi dagli Arabi. La fortezza sorgeva in posizione strategica sulla rocca.
Conquista Saracena	Nel 882, i Saraceni sconfissero i Bizantini e trasformarono una moschea in quella che oggi è la Chiesa di Sant'Antonio Abate.
Dominazione Normanna	Ruggero I fortificò il castello e Polizzi Generosa divenne un centro importante sotto il dominio normanno.
Periodo di Adelasio (1082)	Il conte Ruggero donò Polizzi alla nipote Adelasio, che estese il paese e favorì la convivenza di diverse etnie: bizantini, arabi, latini, ebrei.
Concessione del Titolo "Generosa" (1234)	Federico II attribuì il titolo di "Generosa" alla città per i privilegi e la prosperità del territorio.
Conflitti Feudali (XIV sec.)	Polizzi Generosa fu contesa tra le famiglie Chiaramonte e Ventimiglia. I Ventimiglia ottennero il dominio e la reintegrarono al demanio regio.
Perdita dell'Indipendenza	La città perse la sua indipendenza con l'arrivo di Martino il Giovane, costretta a vendere territori per debiti. Recuperò la sua autonomia nel 1445.
Rinascimento	Periodo di grande splendore artistico e culturale. Polizzi era un nodo viario centrale e beneficiava di privilegi legati alla sua posizione geografica.
Declino Post-Rinascimento	Le epidemie del XVI sec. e conflitti tra nobili e borghesi causarono un lento declino del paese, sebbene ci fosse una ripresa economica nel XIX secolo.
Innovazioni del XX secolo	Nel 1901, Polizzi Generosa introdusse l'elettricità utilizzando un mulino ad acqua locale, segno della laboriosità e innovazione dei suoi abitanti.

Fig. II.3.1.14 | Per le vie di Polizzi Generosa ©Luisa Lombardo, 2023 (fono a sinistra)

Fig. II.3.1.15 | Un "tocco" a Polizzi Generosa ©Luisa Lombardo, 2023 (foto a destra)

Fig. II.3.1.16 | Chiesa Madre in notturna ©Carmelo Di Salvo, 2023 (fono a sinistra)

Fig. II.3.1.17 | Architettura di bese a Polizzi Generosa ©Luisa Lombardo, 2023 (foto a destra)

Fig. II.3.1.18 | Polizzi Generosa e il Palazzo della Cultura dal drone ©Luisa Lombardo, 2023 (fono in basso)

"Lassù nelle Madonie, che è il nome degli Appennini di Sicilia, dove non sono tornato ancora, il paese dei miei primi anni ha spazio. In tutto il gran scenario, oleandri lungo la valle classica, olivi di greppo in greppo, vette chiare calanti a schiera dagli acropoli del centro al mare, infine il mare d'Imera, tagliato a spicchio, dietro l'ultima quinta, non si vede altra città o villaggio. Polizzi Generosa, drappeggiata nel suo superbo epiteto, torreggia da sola".
G.A. Borgese

GIUSEPPE ANTONIO BORGESE

Giuseppe Antonio Borgese nacque a Polizzi Generosa il 12 novembre 1882. Dopo gli studi liceali a Palermo, sotto la guida di Umberto Amico, si trasferì a Firenze nel 1900, dove studiò presso l'Istituto di Studi Superiori, frequentando figure come Vitelli e Villari. Collaborò a diverse riviste, tra cui La Scintilla e L'Archivio per lo studio delle tradizioni popolari. Il fervore intellettuale fiorentino lo portò a unirsi al circolo di Giovanni Papini e a scrivere per Il Leonardo, sviluppando una critica letteraria basata sul nazionalismo cattolico, lontano dalla violenza. Durante questo periodo conobbe e sposò Maria Freschi, dalla quale ebbe due figli, Leonardo e Giovanna.
Borgese si affermò come scrittore e critico letterario di spicco. I suoi scritti iniziali, tra cui Parola e immagine (1903) e Metodo storico e critica estetica (1903), evidenziano un interesse per l'unità poetica e la critica letteraria. Tra le sue opere più importanti si annoverano Rubè (1921), un romanzo che affronta il conflitto interiore dell'uomo moderno. Durante gli anni '30 emigrò negli Stati Uniti, fuggendo dal fascismo e dedicandosi alla lotta intellettuale contro i regimi totalitari. Contribuì alla redazione di un progetto per una costituzione mondiale e continuò a pubblicare saggi fino alla sua morte nel 1952.

PNRR

"*G.A. Borgese genius loci. Alla scoperta del territorio e delle tradizioni. La Cultura e la Bellezza per la rigenerazione culturale e sociale e la valorizzazione del patrimonio pubblico. Interventi finalizzati all'incremento dell'attrattività del borgo.*" è il nome del progetto presentato dal Comune di Polizzi Generosa.

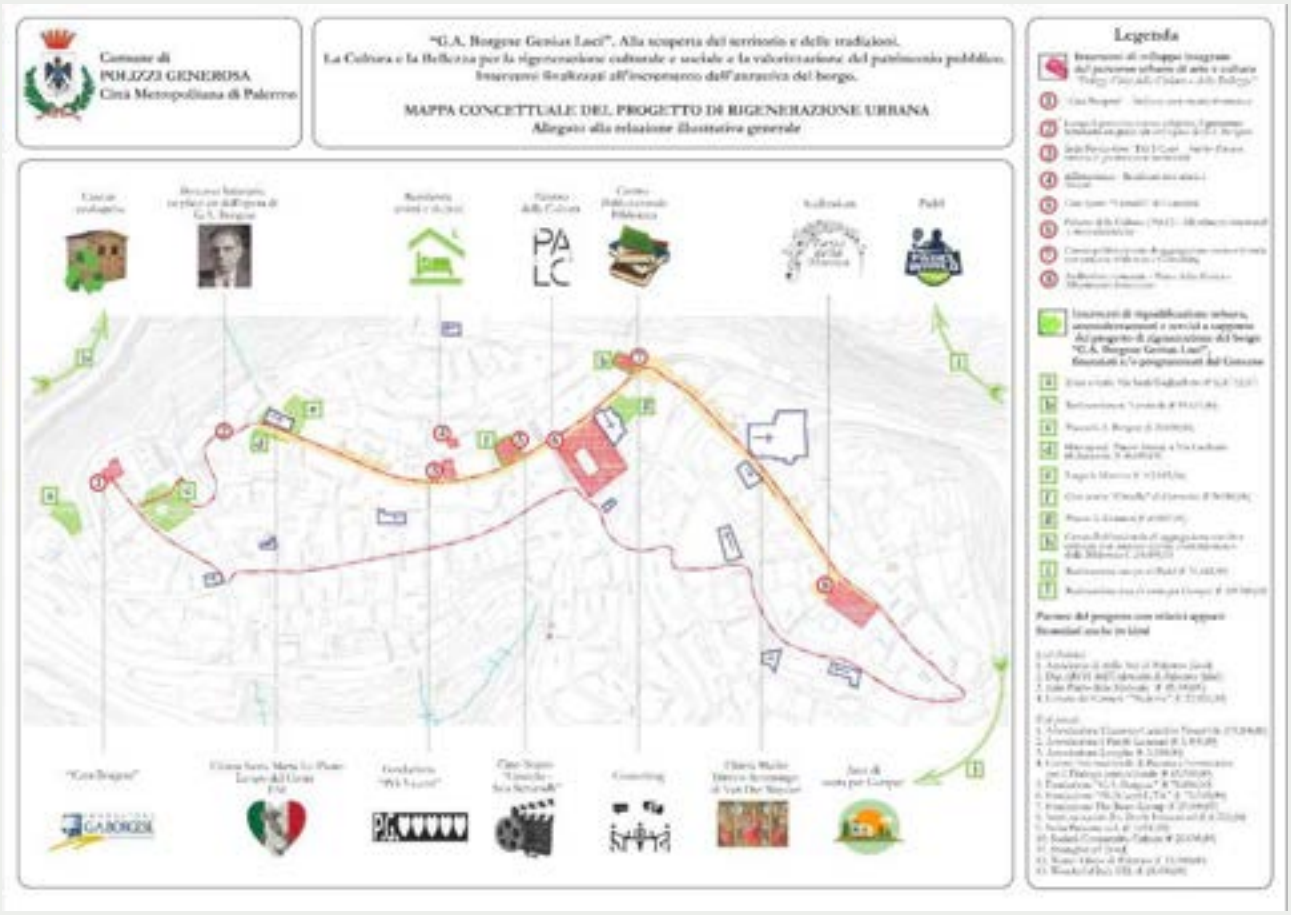


Fig. II.3.1.19 | Progetto finanziato dal PNRR di Polizzi Generosa ©Comune di Polizzi Generosa, 2023

IL PROGETTO PNRR

Il progetto mira a valorizzare le potenzialità del territorio e rilanciare i settori identitari attraverso interventi tecnologici innovativi, con impatti positivi sul tessuto socioeconomico. Il Parco Letterario dedicato a G.A. Borgese, istituito nel 1996 nell'ambito della Sovvenzione Globale Parchi Letterari, è una componente centrale. Tale parco promuove la cultura mediante percorsi letterari ispirati agli scritti di Borgese e alla ricostruzione ambientale della città.

Gli obiettivi del progetto includono:
- **Valorizzazione dei beni culturali:** Attraverso interventi tecnologici per modernizzare e migliorare l'accessibilità dei principali luoghi di interesse storico e artistico.
- **Incremento della domanda turistica:** Coinvolgendo visitatori in periodi fuori stagione e potenziando l'attrattività del borgo.
- **Organizzazione di eventi ricorrenti:** Festival di musica, arte e filosofia saranno programmati per aumentare il flusso turistico e la permanenza dei visitatori.
- **Accessibilità al patrimonio storico-culturale:** Interventi mirati a migliorare l'accessibilità fisica e cognitiva, promuovendo un turismo sostenibile.
- **Senso di responsabilità culturale:** La valorizzazione del patrimonio culturale punta a incentivare la partecipazione attiva della comunità alla rigenerazione del borgo.

Macro-azioni previste
Le azioni del progetto saranno attuate attraverso la riqualificazione di vari "contenitori culturali", tra cui:
- **Palazzo della Cultura e Auditorium:** Interventi mirati per migliorare gli spazi e adattarli a mostre e concerti.
- **Casa Borgese:** Ospiterà un Museo Immersivo dedicato all'autore, con percorsi multimediali e laboratori di cucina tradizionale.
- **Cinema Teatro "Cristallo":** Reso accessibile con tecnologie moderne, inclusi dispositivi per persone con disabilità sensoriali.

Inoltre, il progetto prevede il coinvolgimento di partner, come il Dipartimento di Architettura dell'Università di Palermo, per supportare lo sviluppo di un Polo Socio-Culturale diffuso, orientato a valorizzare la bellezza e la cultura locali. Un percorso urbano "en plein air" collegherà i diversi contenitori culturali, integrandosi nel tessuto storico del borgo.

Sviluppo del percorso urbano di arte e cultura
- **Museo Immersivo della Casa Borgese:** Un museo interattivo che racconta la vita e l'opera di Borgese, con laboratori dedicati alla promozione dei prodotti tipici del territorio.
- **Fondazione "PG5Cuori":** Un atelier culturale promosso dallo stilista Domenico Dolce, dedicato alla promozione territoriale e all'organizzazione di eventi culturali.
- **Residenza per artisti:** Riqualificazione di un edificio comunale abbandonato per trasformarlo in una residenza per artisti, incrementando l'attrattività culturale del borgo.
- **Cine-Teatro Cristallo:** Recentemente riqualificato, il teatro offrirà proiezioni e spettacoli adattati per le persone con disabilità sensoriali, contribuendo alla fruibilità inclusiva del patrimonio culturale.
- **Palazzo della Cultura:** Un centro espositivo per mostre d'arte e innovazione tecnologica, che fungerà da punto focale della rigenerazione urbana.
- **Centro Polifunzionale:** Una biblioteca moderna e spazi di coworking per la diffusione della cultura e della legalità, con l'obiettivo di coinvolgere maggiormente i cittadini.
- **Auditorium Comunale:** Ristrutturato per diventare un Parco della Musica, sarà il fulcro della produzione artistica e musicale del borgo.

Interventi di riqualificazione urbana
Saranno realizzate anche opere di riqualificazione urbana e infrastrutture di supporto al progetto, tra cui:
- **Piazza G.A. Borgese:** Punto di partenza per itinerari en plein air.
- **Slargo accanto al Luogo del Cuore FAI:** Riqualificazione della zona accanto alla chiesa di Santa Maria Gesù Lo Piano.

Infine, saranno realizzate ecoisole, un campo di padel, e un'area di sosta per camper nei pressi del Parco urbano dedicato a Falcone e Borsellino. Questi interventi concorrono a rafforzare l'attrattività turistica e culturale del borgo, migliorando la qualità della vita della comunità locale.

ANALISI SWOT

L'analisi SWOT consente di identificare i punti di forza, debolezza, opportunità e minacce del Comune di Polizzi Generosa, evidenziando gli aspetti fondamentali per lo sviluppo intelligente e sostenibile del territorio.

Punti di Forza (Strengths):

- **Patrimonio culturale e storico:** Polizzi Generosa vanta un vasto patrimonio culturale e storico, con monumenti di rilievo, chiese, musei e tradizioni locali che risalgono a epoche antiche, inclusa l'eredità bizantina e normanna.
- **Posizione geografica strategica:** il comune gode di una posizione che lo rende un importante crocevia per il turismo naturalistico e culturale.
- **Biodiversità e ricchezze naturali:** La presenza di parchi naturali e aree protette, unitamente a una gestione consapevole delle risorse naturali, fa di Polizzi un punto di riferimento per l'eco-turismo.
- **Offerta turistica variegata:** Il comune dispone di numerose strutture ricettive (hotel, B&B, agriturismi) e attività ricreative che favoriscono un flusso turistico costante.
- **Comunità mediamente attiva e coesa:** Partecipazione dei cittadini nelle decisioni locali e una forte coesione sociale, sostenuta da associazioni di volontariato e iniziative culturali.
- **Titolo di "Generosa":** Il riconoscimento storico di città demaniale offre prestigio e un'immagine di rilevanza culturale.

Punti di Debolezza (Weaknesses):

- **Declino demografico:** Polizzi soffre di un trend migratorio negativo, con un progressivo spopolamento e un'età media elevata, che limita lo sviluppo di iniziative economiche.
- **Scarse infrastrutture tecnologiche:** Nonostante alcuni progressi, la copertura di banda larga e fibra ottica è limitata, ostacolando lo sviluppo digitale e l'innovazione.
- **Difficoltà nei trasporti pubblici:** L'accessibilità stradale è carente, assente quella ferroviaria, saltuaria quella dei bus e i collegamenti pubblici sono insufficienti, rendendo complicati gli spostamenti verso i centri maggiori.
- **Settore economico debole:** L'economia locale è prevalentemente basata su agricoltura e turismo, ma manca di diversificazione e innovazione tecnologica nei settori produttivi così come nel settore terziario e l'industria.
- **Scarsa capacità di attrarre giovani imprenditori:** La mancanza di opportunità e servizi limita la capacità del comune di trattenere e attrarre talenti giovanili, sia locali che esterni.

Opportunità (Opportunities):

- **Fondi europei:** La possibilità di accesso a finanziamenti e fondi per lo sviluppo sostenibile, l'innovazione tecnologica e la valorizzazione del patrimonio culturale e naturale.
- **Sviluppo del turismo sostenibile:** L'ampliamento dell'offerta turistica legata alla natura, al turismo enogastronomico e al turismo esperienziale potrebbe attrarre nuovi visitatori e favorire l'economia locale.
- **Iniziative smart city:** La crescita di progetti smart city, con soluzioni innovative per la gestione dell'illuminazione, dei rifiuti e della mobilità, potrebbe migliorare la qualità della vita e favorire la sostenibilità.
- **Collaborazioni pubblico-private:** Rafforzare partnership con enti pubblici e privati per la valorizzazione delle risorse locali e il miglioramento delle infrastrutture.
- **Recupero:** Possibilità di recuperare e rendere efficiente l'edilizia di base.

Minacce (Threats):

- **Spopolamento continuo:** Se non contrastato, il calo della popolazione potrebbe compromettere ulteriormente la sostenibilità economica e sociale del comune.
- **Cambiamenti climatici:** Eventuali problemi ambientali legati al cambiamento climatico potrebbero danneggiare le risorse naturali, compromettendo settori come l'agricoltura e il turismo.
- **Competizione turistica:** La concorrenza con altre destinazioni turistiche regionali potrebbe rendere più difficile attrarre visitatori, soprattutto se non si investe in marketing territoriale.
- **Difficoltà economiche globali:** Eventuali crisi economiche a livello nazionale o internazionale potrebbero ridurre i fondi disponibili per lo sviluppo locale e limitare gli investimenti nel comune.

TABELLA SWOT

Punti di Forza (Strengths)
- Ricco patrimonio culturale, storico e architettonico;
- Posizione strategica nelle Madonie;
- Biodiversità e parchi naturali;
- Offerta turistica variegata;
- Comunità attiva e coesa;
- Riconoscimento storico come città "Generosa".

Punti di Debolezza (Weaknesses)
- Declino demografico e spopolamento;
- Scarse infrastrutture tecnologiche;
- Trasporti pubblici carenti;
- Economia locale poco diversificata;
- Difficoltà ad attrarre giovani imprenditori.

Opportunità (Opportunities)
- Accesso a fondi europei;
- Sviluppo del turismo sostenibile;
- Implementazione di soluzioni smart per creare Smart Villages;
- Collaborazioni pubblico-private.

Minacce (Threats)
- Spopolamento;
- Impatti dei cambiamenti climatici;
- Competizione con altri paesi;
- Crisi economiche che limitano i finanziamenti.

Fig. II.3.1.20 | PPolizzi da un campanile ©Luisa Lombardo, 2024

II.3.2 Tutela Smart del territorio madonita. Strumenti di valorizzazione

Alla luce del tirocinio aziendale previsto dalla borsa INPS, in collaborazione con il Tutor Aziendale arch. Delia Geraci della Soprintendenza ai Beni Culturali e Ambientali della Provincia di Palermo, lo studio approfondito dell'area madonita è stato condotto seguendo il programma concordato ex ante e in sinergia con l'Università Politecnica di Valencia e la Real Academia de Bellas Artes de San Carlos de Valencia.
In particolare, sono stati affrontati i seguenti ambiti:

- **analisi dei contesti urbani spagnoli**, al fine di confrontare similitudini e differenze con l'area delle Madonie, con l'obiettivo di individuare best practices e strategie innovative applicabili al contesto madonita;
- **studio delle strategie per l'efficientamento energetico del patrimonio edilizio esistente**, con l'adozione di soluzioni sostenibili, tecnologiche e compatibili con il patrimonio costruito. È stata prestata particolare attenzione a soluzioni alternative ai tradizionali dispositivi tecnologici, come il fotovoltaico micro-invasivo, i coppi fotovoltaici, le tegole solari, il fotovoltaico da balcone, le balaustre, le ringhiere e i parapetti fotovoltaici, nonché l'impiego di globi solari, torri del vento, camini solari, eolico domestico e mini eolico. L'obiettivo era riqualificare energeticamente il patrimonio residenziale con interventi a basso impatto ambientale;
- **analisi degli interventi compatibili** con il costruito, focalizzandosi sul miglioramento dell'accessibilità nei borghi montani e sullo sviluppo della digitalizzazione in contesti rurali. Sono state proposte soluzioni per il cablaggio in fibra ottica e per l'implementazione di sistemi digitali, con l'intento di rendere i borghi madoniti più accessibili a turisti e a utenze fragili;
- **esame degli strumenti a supporto dei progettisti per il recupero dell'architettura e la valorizzazione dei centri storici**, con particolare attenzione alle soluzioni normative e tecniche per un intervento compatibile con il patrimonio storico-culturale.

L'approccio integrato ha permesso di sviluppare strategie mirate per la valorizzazione e la rigenerazione del territorio madonita, promuovendo soluzioni innovative, sostenibili e compatibili con le peculiarità storiche e ambientali del contesto.

L'esigenza di superare l'approccio tradizionale e rigido dei manuali di recupero, dei prontuari e dei codici di pratica – concepiti principalmente come elenchi di soluzioni architettoniche per il recupero e, talvolta, la ricostruzione del patrimonio edilizio – invita a una riflessione sulla reale utilità e sulle implicazioni pratiche di tali strumenti. Non solo i tecnici specializzati, ma anche i cittadini, spesso poco familiari a questi temi, possono trovare tali strumenti poco accessibili. I manuali, infatti, tendono a proporre una visione statica e uniforme dell'edilizia storica, riproducendo elementi catalogati e descritti in modo meccanico e standardizzato molto vicini alla formazione tecnica. Di contro, con il supporto della Soprintendenza, è stata formulata l'idea di predisporre strumenti operativi più accessibili, concepiti per consentire a una platea più ampia di considerare l'architettura non come una prerogativa esclusiva dei tecnici o dei committenti illuminati, ma come un patrimonio comune, comprensibile e gestibile da tutti (Degli Innocenti, 2005). Tali strumenti, pur rimanendo formulati in modo accessibile ovvero fruibili ai più, sono progettati per includere il supporto di tecnici specializzati, indispensabili per risolvere le specifiche problematiche locali.

A una visione statica e standardizzata, a un linguaggio spesso eccessivamente tecnico e alla carenza di flessibilità, questi nuovi strumenti intendono sostituire un linguaggio chiaro e semplice, comunque arricchito da glossari e dizionari che diffondano il linguaggio architettonico e tecnico. Si propone, dunque, una visione dinamica del patrimonio, considerandolo come un organismo vivo, in continua evoluzione e soggetto a trasformazioni multiple e diversificate. Inoltre, si intende promuovere il coinvolgimento dei cittadini,

valorizzando le loro conoscenze e competenze per stimolarne la partecipazione attiva ai processi decisionali.

L'adattamento dei contenuti alle diverse esigenze degli utenti può avvenire tramite simulazioni e attività interattive, nonché mediante materiali più fruibili come fotografie, schemi, infografiche e immagini. Tali strumenti, grazie all'uso di tecnologie e sistemi innovativi e intuitivi, mirano a reinterpretare la comprensione dell'architettura in una prospettiva *smart*.

Si aggiunga, inoltre, la difficoltà dovuta alla mancanza di strumenti operativi che supportino i tecnici nella comprensione delle modalità di intervento sul patrimonio costruito. Non è raro, infatti, che progetti subiscano ritardi e affrontino iter burocratici eccessivamente lunghi proprio a causa di questa problematica. In Sicilia sono poche, se non pochissime, le amministrazioni che godono di strumenti adeguati per la tutela e la valorizzazione dell'architettura tradizionale. Ciò comporta la realizzazione di interventi di scarso valore architettonico, una riduzione della motivazione dei tecnici – spesso scoraggiati e privi di esempi virtuosi a cui ispirarsi – e un'inadeguata gestione da parte degli enti di tutela.

L'esperienza ha condotto alla creazione di due tomi, uno per il caso specifico di Polizzi Generosa, delle Linee guida operative per agire sul patrimonio costruito presente con esempi esaustivi di interventi e richiami alla tutela e alla valorizzazione dell'architettura di base, e uno per tutto il Comprensorio Madonita, un atlante di soluzioni tecnologiche compatibili con il patrimonio costruito; l'intento è quello di rappresentare una concezione dinamica e "sempre aperta" di soluzioni applicabili in situ, dove ogni singolo elemento, ogni singola soluzione viene trattata come un caso a sé, con un approccio critico e contestualizzato, nonchè semplice per abituare non solo il tecnico, ma anche il cittadino a comprendere quali soluzioni possono essere applicabili nell'architettura locale (Ciaffi, 2011).

L'atlante, dunque, si fonda su una concezione "geografica", in cui la catalogazione non è esaustiva e dogmatica, ma diventa un repertorio di casi analizzati criticamente in un'ottica di conoscenza e conservazione, evolvendo in un documento vivente che potrebbe aggiornarsi continuamente con nuove informazioni, soluzioni e *best practices* ricavate da soluzioni già affrontate in altri contesti, o nel caso studio specifico. Un ventaglio di opzioni possibili ed efficaci per riportare il comparto edilizio locale e rurale da una condizione iniziale di vetustà, a condizioni di contemporaneità.

L'Atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie è stato concepito, dunque, come uno strumento operativo destinato ai tecnici e alle amministrazioni comunali, ai cittadini e alle associazioni locali, con l'obiettivo di favorire il recupero del patrimonio edilizio esistente e sviluppare buone pratiche compatibili con il contesto storico e culturale. Mira a semplificare i processi burocratici, perchè le soluzioni tecnologiche al suo interno sono validate dalla Soprintendenza, e ad orientare le scelte progettuali da intraprendere, offrendo soluzioni tecnologiche innovative che rispettino il patrimonio costruito, e dunque compatibili, in un'ottica di sostenibilità e integrazione tra tradizione e innovazione.

La sua struttura è frutto di una serie di disamine di alcuni atlanti, manuali, prontuari, codici di pratica realizzati negli ultimi venti anni da tantissimi tecnici del settore al fine di coniugare la fattibilità tecnica ed operativa delle soluzioni, con la praticità della comprensione e replicabilità della scelta operativa, in termini di applicazione che in termini di esigenze, requisiti e prestazioni. Nonchè casi di manuali e supporti utilizzati a Barcellona che hanno consentito un approccio vicino al cittadino e ai suoi bisogni, ma anche alla possibilità di renderlo consapevole di scelte quotidiane utili a migliorare l'*indoor* e l'*outdoor* comfort con scelte quitidiane e consapevoli.

Firmitas, Utilitas, Venustas, espressi da Vitruvio in tempi molto lontani, sono stati considerati come pilastri per la progettazione dei supporti da produrre.

Strutturato in categorie specifiche quali efficientamento energetico, vul-

nerabilità sismica, recupero idrico, accessibilità allargata, comunità energetiche, decoro urbano, digitalizzazione, cooperative di comunità, finanziamenti, *governance*, business plan e adeguamento acustico, l'atlante fornisce per ciascuna di esse, individuate a monte dello studio effettuato sugli *Smart Villages* nel mondo e sulla possibilità di intraprendere diverse strade per il raggiungimento del concetto *smart*, una dettagliata descrizione delle soluzioni proposte in termini di principio di funzionamento, applicabilità, vantaggi, svantaggi e rischi e normativa di riferimento. Ogni categoria è, infatti, corredata da esempi pratici, casi studio di interventi già realizzati nel territorio o in altri (per contrasto o analogia) e una scheda quantitativa che consente di valutare l'efficacia di alcune soluzioni che riguardano l'utente in termini di impatto e costi; oltre a questo anche guide e suggerimenti per enti, amministrazioni e associazioni in grado di guidare il territorio con soluzioni *smart*, innovative e, per il caso delle Madonie, ancora inesplorate

Il caso studio di riferimento di partenza è dunque il Comune di Polizzi Generosa, ma l'atlante prende in considerazione soprattutto gli altri comuni del Parco delle Madonie, offrendo una panoramica completa delle possibilità di intervento in una zona particolarmente ricca di patrimoni architettonici, storici e naturali, di fare rete e un network di villaggi pensanti e collaboranti sotto il profilo tecnologico e di contribuire ad una rinascita dei territori condivisa e compatta, senza tralasciare alcuno indietro.

Per identificare le soluzioni tecnologiche più idonee, sono state contattate, inoltre, diverse aziende italiane ed europee, selezionando quelle in grado di combinare tradizione e innovazione. Sono stati richiesti, per verificarne l'applicabilità, campioni dimostrativi alle aziende e organizzati incontri conoscitivi per approfondire le caratteristiche e le potenzialità di ciascun prodotto.

Fig. II.3.2.1 | Madonna degli Schiavi o Madonna della Porta ©Luisa Lombardo, 2024

III.3.3 Atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie

L'Atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie rappresenta un punto di svolta nell'approccio alla tutela e alla valorizzazione del patrimonio architettonico e naturale di questa regione. Questo progetto nasce dall'esigenza di rispondere alle linee guida tracciate dal Piano Nazionale di Ripresa e Resilienza (PNRR), che offre una straordinaria opportunità per il rilancio delle aree interne italiane, attraverso interventi mirati di recupero e rigenerazione dei contesti rurali. In questo quadro, l'Atlante si pone come strumento operativo e strategico per integrare le tecnologie moderne con le peculiarità storiche, culturali e ambientali del territorio madonita, offrendo soluzioni innovative, ma profondamente rispettose delle tradizioni locali e dell'ambiente protetto.

L'iniziativa, in linea con la dinamica degli Smart Villages, mira non solo alla semplice conservazione del patrimonio, ma alla sua trasformazione in un volano di sviluppo sostenibile, che possa contribuire alla crescita economica, sociale e culturale delle Madonie. L'ambizione di fondo è quella di proporre una strategia integrata che parte dalla considerazione del patrimonio costruito, delle possibilità di un recupero compatibile e che coinvolga attori pubblici e privati, comunità locali e professionisti del settore, in un processo di rigenerazione che tocchi sia gli aspetti materiali del patrimonio, come gli edifici storici e i paesaggi rurali e naturali, sia quelli immateriali, come le tradizioni culturali e le identità locali nonché processi gestionali di *governance* per aiutare le piccole comunità come quella in esame ad emergere e a trovare lo stimolo necessario per progettualità condivise.

Sono stati presi in considerazione alcuni casi di riferimento particolarmente innovativi e utili per i territori, tra cui l'Atlante di Barcellona e le Linee guida per il miglioramento dell'efficienza energetica nel patrimonio culturale, redatte nel 2015 dalla Soprintendenza Archeologia, Belle Arti e Paesaggio per l'area metropolitana di Venezia e le province di Belluno, Padova e Treviso. Questi strumenti rappresentano elementi chiave per lo sviluppo e l'innovazione tecnologica nei contesti territoriali e in contesti come il Nord Italia hanno funzionato e funzionano tantissimo per processi di recupero e valorizzazione.

L'indice dell'Atlante del Parco delle Madonie è strutturato per guidare tecnici, amministrazioni e comunità locali nelle attività di recupero del patrimonio edilizio, assicurando il rispetto delle peculiarità storiche e culturali del territorio. L'Atlante esordisce con una sezione introduttiva e prosegue delineando l'oggetto delle linee di indirizzo, illustrandone finalità e criteri, unitamente al quadro delle principali disposizioni normative di riferimento.

Questa cornice iniziale serve a contestualizzare e orientare le successive sezioni, favorendo una comprensione chiara delle modalità d'intervento possibili. A seguire, una sezione dedicata all'analisi del contesto madonita esplora i beni architettonici in relazione al Codice dei beni culturali e del paesaggio, soffermandosi sui centri minori e sulle caratteristiche tecnico-costruttive dell'edilizia storica, con approfondimenti specifici sul tessuto urbano, sulle tipologie edilizie e sui beni isolati. Questa parte fornisce una base di conoscenza indispensabile per intervenire consapevolmente e nel rispetto della storia e dell'identità locale.

L'Atlante ha come obiettivo principale quello di fornire un quadro organico di criteri, soluzioni e strumenti che possano guidare gli interventi di recupero e riqualificazione delle aree rurali delle Madonie, secondo i principi di sostenibilità economica, ambientale e sociale. Questo approccio si fonda sulla necessità di garantire che gli interventi rispettino e valorizzino le specificità locali, mantenendo intatto il legame tra il patrimonio architettonico e il paesaggio circostante. Al contempo, si intende promuovere pratiche tecniche che rendano gli interventi più efficienti, fluidi e capaci di superare le criticità burocratiche e tecniche spesso riscontrate nei progetti di recupero in Sicilia e nella Provincia di Palermo.

L'obiettivo a lungo termine è quello di attivare un circolo virtuoso che, attraverso soluzioni compatibili garantisce il recupero del patrimonio e possa generare ricadute positive su tutta la comunità locale, creando nuove opportunità lavorative, favorendo il turismo sostenibile e rafforzando il tessuto economico del territorio. Un approccio "smart", che valorizzi l'uso delle tecnologie digitali e delle soluzioni innovative per ottimizzare la gestione delle risorse e la qualità della vita delle comunità coinvolte (Ciaffi, 2011).

Si articola in diverse sezioni, ognuna delle quali affronta temi cruciali per il recupero e la valorizzazione del patrimonio delle Madonie che evidenziano la centralità di questioni come la sostenibilità energetica, la resilienza ai cambiamenti climatici, la tutela del paesaggio e la rigenerazione dei centri storici.

Tra i temi principali trattati dall'Atlante troviamo:

- **efficientamento energetico degli edifici storici:** migliorare le prestazioni energetiche del patrimonio costruito, senza alterarne le caratteristiche architettoniche e storiche. L'Atlante propone soluzioni tecnologiche avanzate, come l'uso di materiali naturali ad alte prestazioni, l'integrazione di impianti a basso impatto visivo e l'impiego di tecnologie passive che sfruttano le caratteristiche ambientali per ridurre il consumo energetico.
- **vulnerabilità sismica e miglioramento strutturale:** garantire la sicurezza degli edifici storici attraverso interventi strutturali mirati. L'Atlante offre una serie di linee guida su come intervenire sugli edifici storici per migliorarne la resistenza sismica, rispettando al contempo le tecniche costruttive tradizionali.
- **gestione delle risorse idriche:** soluzioni per ottimizzare la gestione delle risorse idriche, attraverso la raccolta e il riutilizzo delle acque piovane, la realizzazione di sistemi di irrigazione a basso consumo e la valorizzazione delle pratiche agricole tradizionali che garantiscono una gestione sostenibile del territorio.
- **accessibilità e inclusività:** soluzioni tecniche per migliorare l'accessibilità degli edifici storici e delle aree pubbliche, senza compromettere il valore architettonico e paesaggistico del patrimonio esistente.
- **sostenibilità economica e sociale:** Un aspetto centrale del progetto è quello di garantire che gli interventi di recupero e valorizzazione abbiano un impatto positivo anche a livello economico e sociale. L'Atlante fornisce strumenti per la creazione di business plan e strategie di sviluppo locale che possano promuovere l'imprenditorialità e il turismo sostenibile, generando nuove opportunità economiche per le comunità locali.

Le ricadute sul territorio delle Madonie, in questo modo, sono molteplici e

potenzialmente di grande rilevanza. In primo luogo, il recupero e la valorizzazione del patrimonio architettonico e naturale contribuiscono a preservare l'identità culturale e storica delle comunità locali, rafforzando il legame tra la popolazione e il proprio territorio. In secondo luogo, gli interventi previsti mirano a migliorare la qualità della vita dei residenti, attraverso la creazione di spazi pubblici più accessibili, sicuri ed efficienti, e l'introduzione di tecnologie che riducono i consumi energetici e migliorano la sostenibilità ambientale. In ultimo, supporta anche i tecnici nelle valutazioni preliminari del progetto e nella proposizione di una documentazione idonea.

Dal punto di vista economico, la rigenerazione del patrimonio può agire da catalizzatore per lo sviluppo di nuove attività economiche legate al turismo, all'agricoltura sostenibile e all'artigianato locale. In questo senso, non si limita a proporre soluzioni tecniche, ma offre anche indicazioni su come trasformare il recupero del patrimonio in un'opportunità di crescita economica e sociale per le Madonie.

Integra un approccio *Smart* alla gestione del patrimonio, basato sull'uso di tecnologie digitali e soluzioni innovative per ottimizzare la gestione delle risorse e migliorare l'efficienza degli interventi. Le mappe di rete, che chiudono i capitoli operatici, inoltre, mostrano la situazione del comparto madonita consentendo di individuare i comuni più virtuosi o in posizione vantaggiosa rispetto a tutto il territorio e dunque, ad esempio, rappresentano uno strumento chiave per promuovere la collaborazione tra i diversi comuni del Parco delle Madonie, creando sinergie tra i progetti virtuosi e ottimizzando l'uso delle risorse pubbliche e private nonché promuovere e diffondere la consapevolezza su quanto si può fare e come è possibile collaborare.

In conclusione, l'Atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie rappresenta una guida completa e strutturata per affrontare le sfide del recupero del patrimonio rurale in Sicilia, con una visione integrata che combina innovazione tecnologica e rispetto delle tradizioni locali. Il suo impatto potrà contribuire in modo significativo alla crescita sostenibile del territorio, in linea con gli obiettivi del PNRR, rafforzando l'identità delle comunità locali e offrendo nuove prospettive di sviluppo economico e sociale.

Fig. III.3.3.1 | A Soprana ©Salvatore Fiume, 2023

Fig. III.3.3.2 | Metodologia di Ricerca presso la Soprintendenza ©2023, Luisa Lombardo

II.3.3.1 Metodologia adottata per la spiegazione dell'Atlante

L'Atlante è stato concepito come uno strumento operativo e analitico, volto a favorire una comprensione approfondita delle peculiarità del territorio madonita e a definire strategie di intervento mirate. La sua consultazione si basa su un approccio sistematico e interdisciplinare, organizzato secondo le diverse sezioni tematiche e applicative delineate nell'indice.

Il percorso metodologico inizia con una sezione introduttiva che esplicita le finalità e i criteri guida, accompagnata da un quadro delle principali disposizioni normative. Questa parte preliminare fornisce un inquadramento generale indispensabile per comprendere le motivazioni e gli obiettivi alla base della struttura complessiva dell'Atlante.

Il terzo capitolo costituisce il nucleo conoscitivo del documento, offrendo un'analisi dettagliata del contesto architettonico e paesaggistico delle Madonie. In esso vengono approfonditi i beni architettonici in relazione alla normativa vigente, le caratteristiche dei centri minori e i tratti distintivi dell'edilizia storica, con particolare attenzione al tessuto urbano, alle tipologie edilizie e ai beni isolati. Questo livello di analisi rappresenta il fondamento per definire i criteri valutativi e le strategie di intervento sviluppate nei capitoli successivi.

Questi ultimi affrontano specifiche tematiche con una struttura metodologica rigorosa che comprende la diagnosi dello stato attuale, l'analisi delle criticità e l'elaborazione di procedure migliorative. Tra gli argomenti trattati figurano la qualità ambientale degli edifici storici, l'efficienza energetica, la vulnerabilità sismica, l'accessibilità, il decoro urbano e la gestione delle risorse idriche. Ogni tematica è accompagnata da linee guida operative che bilanciano le esigenze di tutela del patrimonio con soluzioni innovative e sostenibili.

Un valore aggiunto è dato dalle schede illustrative, strumenti pratici per l'applicazione dei contenuti teorici. Inizialmente presentate in forma schematica per chiarire chiavi di lettura e metodologia, le schede includono esempi pratici suddivisi in sezioni tematiche. Ogni sezione comprende: Ambito di applicazione, Scheda tipo, Buone pratiche, Interventi sul manufatto architettonico, Esempi presenti nel territorio, Misure per l'utente, Analisi quantitativa e Mappe di rete.

Attraverso esempi concreti, buone pratiche tratte da altri contesti territoriali e mappe di rete elaborate ad hoc, questa sezione permette di tradurre le analisi in interventi operativi, rendendo l'Atlante un supporto immediatamente fruibile per tecnici, amministratori e cittadini. Un altro elemento distintivo dell'Atlante è l'introduzione di criteri smart, approfonditi in capitoli dedicati. Questi criteri rappresentano un approccio innovativo alla gestione del territorio, integrando tecnologia, sostenibilità e tradizione. Tra i temi trattati si evidenziano la digitalizzazione del patrimonio costruito, la formazione di comunità energetiche, l'implementazione di sistemi di governance efficaci e la promozione di cooperative di comunità, strumenti fondamentali per rafforzare la coesione sociale e stimolare lo sviluppo locale. I capitoli conclusivi, incentrati sull'elaborazione di business plan, sulla gestione dei finanziamenti e sul raggiungimento degli obiettivi dell'Agenda 2030, offrono una prospettiva strategica di lungo termine, orientando i contenuti dell'Atlante verso interventi sostenibili e duraturi.

La metodologia di consultazione rispecchia quindi la struttura dell'Atlante: un percorso progressivo che, partendo dalla conoscenza approfondita del territorio, guida il lettore attraverso criteri analitici e progettuali fino alla definizione di strategie applicative. Queste coniugano la tutela del patrimonio con l'innovazione tecnologica, in un'ottica integrata e sostenibile.

Di seguito è illustrato l'indice dell'Atlante per una consultazione preliminare:

1. INTRODUZIONE
2. OGGETTO DELLE LINEE D'INDIRIZZO
- 2.1 - Finalità e criteri
- 2.2 - Quadro delle principali disposizioni normative

3. CONOSCENZA DEL CONTESTO MADONITA
- 3.1 - I beni architettonici in riferimento al Codice dei beni culturali e dal paesaggio
- 3.2 - I centri minori del Parco delle Madonie
- 3.3 - Analisi dei caratteri tecnico-costruttivi dell'edilizia storica
  - 3.3.1 - Il tessuto urbano e l'edilizia di base
  - 3.3.2 - Tipologie edilizie
  - 3.3.3 - I beni isolati

4. VALUTAZIONE DELLA QUALITÀ AMBIENTALE DEGLI EDIFICI STORICI
- 4.1 - Il comfort termico
- 4.2 - Il comfort visivo
- 4.3 - Il comfort acustico
- 4.4 - La qualità dell'aria
- 4.5 - La qualità ambientale

5. SCHEDE ILLUSTRATIVE
- 5.1 - Ambito di applicazione

5.2 - Scheda tipo
5.3 - Buone pratiche
5.4 - Interventi sul manufatto architettonico
5.5 - Esempi presenti nel territorio
5.6 - Misure per l'utente
5.7 - Analisi quantitativa
5.8 - Mappe di rete

6. CATEGORIE

7. VALUTAZIONE DELL'EFFICIENZA ENERGETICA PER IL PATRIMONIO COSTRUITO E PROPOSTE DI INTERVENTO

7.1 - La diagnosi energetica degli edifici storici
7.2 - Procedure per migliorare l'efficienza energetica degli edifici
Indice delle soluzioni tecnologiche individuate

8. VALUTAZIONE DELLA VULNERABILITÀ SISMICA DEL PATRIMONIO COSTRUITO E PROPOSTE DI INTERVENTO

8.1 - La diagnosi di vulnerabilità sismica degli edifici storici
8.2 - Procedure per migliorare la vulnerabilità sismica degli edifici
Indice delle soluzioni tecnologiche individuate

9. VALUTAZIONE DEI CRITERI SMART PER RECUPERO IDRICO E PROPOSTE DI INTERVENTO

9.1 - La diagnosi del recupero idrico
9.2 - Procedure per il recupero idrico
9.3 - Il consumo d'acqua nelle nostre case
9.4 - Risparmio idrico VS siccità
Indice delle soluzioni tecnologiche individuate

10. VALUTAZIONE DEI CRITERI SMART PER IL MIGLIORAMENTO DELL'ACCESSIBILITÀ E PROPOSTE DI INTERVENTO

10.1 - La diagnosi dell'accessibilità
10.2 - Procedure per migliorare l'accessibilità
Indice delle soluzioni tecnologiche individuate

11. VALUTAZIONE DEI CRITERI SMART PER IL RAGGIUNGIMENTO DI ENERGY COMMUNITIES E PROPOSTE DI INTERVENTO

11.1 - Le comunità energetiche
11.2 - Gli indispensabili
11.3 - Caratteristiche della comunità energetica

12. VALUTAZIONE DEI CRITERI SMART PER IL MIGLIORAMENTO DEL DECORO URBANO E PROPOSTE DI INTERVENTO

12.1 - La diagnosi del decoro urbano
12.2 - Procedure per migliorare il decoro urbano
Indice delle soluzioni tecnologiche individuate

13. VALUTAZIONE DEI CRITERI SMART PER L'ADEGUAMENTO ACUSTICO

13.1 - La diagnosi dell'acustica
13.2 - Procedure per il miglioramento acustico
Indice delle soluzioni tecnologiche individuate

14. MISURE ATTIVE, MISURE PASSIVE E SALUTE E COMFORT

15. VALUTAZIONE DEI CRITERI DI DIGITALIZZAZIONE DEL PATRIMONIO COSTRUITO

16. VALUTAZIONE DEI CRITERI SMART PER LA FORMAZIONE DI COOPERATIVE DI COMUNITÀ

17. VALUTAZIONE DEI CRITERI SMART PER APPROCCI DI GOVERNANCE

18. BUSINESS PLAN

19. VALUTAZIONE DEI CRITERI SMART PER LA GESTIONE DEI FINANZIAMENTI

20. Verso gli obiettivi dell'Agenda 2030

Nell'ambito dell'Atlante, a titolo esemplificativo, viene presentata una scheda illustrativa scomposta che propone una soluzione tecnologica per il miglioramento del patrimonio costruito. La lettura della scheda richiede un approccio sistematico che segue un preciso ordine logico: dall'alto verso il basso e da sinistra verso destra, per assicurare una comprensione completa e strutturata delle informazioni fornite.

La sezione di sinistra della scheda, come quella qui in basso, è dedicata alla descrizione dettagliata della soluzione tecnologica. Gli elementi principali, elencati in sequenza, sono:

- **Titolo della soluzione proposta:** un'intestazione sintetica che identifica l'intervento;
- **Principio di funzionamento:** una spiegazione tecnica che illustra il meccanismo alla base della soluzione;
- **Applicabilità:** un'indicazione delle condizioni e dei contesti in cui la proposta risulta implementabile;
- **Vantaggi, svantaggi e rischi:** una valutazione critica che evidenzia i benefici potenziali, le limitazioni e le eventuali problematiche connesse all'adozione della soluzione;
- **Sinergie e interazioni:** un'analisi delle possibili connessioni con altri interventi o con il contesto in cui la soluzione viene applicata;
- **Normativa di riferimento:** una sezione conclusiva che fornisce i riferimenti legislativi o normativi utili per garantire conformità e sicurezza nell'applicazione.

In. 26 COPPI FOTOVOLTAICI INVISIBILI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede lo smontaggio e la sostituzione dei coppi tradizionali esistenti con coppi fotovoltaici per la produzione di energia solare mantenendo inalterato l'aspetto estetico e la funzionalità della classica copertura in cotto. Ciascun modulo o coppo, generalmente, risulta formato con un composto polimerico atossico e riciclabile, che viene appositamente lavorato per incentivare l'assorbimento dei fotoni. All'interno del modulo sono incorporate delle normali celle di silicio monocristallino. La superficie, opaca alla vista e trasparente per i raggi solari, permette alla luce di entrare ed alimentare le celle invisibili.

APPLICABILITÀ

L'installazione del coppo si effettua con pochi e semplici passaggi. Il sistema è simile a quello utilizzato per i classici coppi in cotto e permette di sostituire la copertura esistente senza bisogno di strutture aggiuntive. È pratico da installare, non necessita di strutture aggiuntive e sostituisce i coppi di copertura esistenti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Il Coppo invisibile si distingue dalle altre tecnologie fotovoltaiche e dai classici coppi in cotto, grazie a particolari caratteristiche che lo rendono unico.

- INTEGRATO: Installato come un coppo in cotto, si mimetizza nella continutà estetica del tetto.
- FOTOCATALITICO: La luce attiva un processo naturale e infinito che purifica l'aria mentre pulisce la superficie del coppo.
- RESISTENTE: Può sopportare un elevato carico statico, non teme solventi chimici e agenti atmosferici.
- SOSTENIBILE: Realizzato con materiali atossici, anche naturali o da riuso, tutti riciclabili.

Svantaggi: Necessitano di continua manutenzione per valutare l'efficienza e l'efficacia, si consiglia il controllo a campione. La resa è poco inferiore rispetto ad un normale pannello fotovoltaico.

Rischi: La colorazione potrebbe risultare non esattamente fedele ai coppi originali, ma di un rosso leggermente più accentuato a causa della produzione al dettaglio.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza, occorre verificare le caratteristiche energetiche, essendo prodotti a mano, infatti, necessitano di un controllo saltuario per la verifica del funzionamento. Il sistema funziona meglio se collegato all'impianto di riscaldamento per la produzione di calore e ACS.

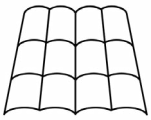
NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017

La sezione destra della scheda si concentra, invece, sugli aspetti classificatori e sull'impatto pratico della soluzione tecnologica, organizzati nei seguenti punti:

- **Categoria afferente dell'Atlante:** la macro-categoria tematica cui appartiene la soluzione, ad esempio, efficienza energetica, accessibilità, o decoro urbano;
- **Elemento tecnico preso in considerazione:** la parte dell'edificio o del sistema su cui l'intervento agisce;
- **Azione adottata nell'edificio:** la funzione specifica che la soluzione svolge, come isolamento termico, riduzione del consumo idrico o miglioramento dell'acustica.;
- **Compatibilità, reversibilità e invasività:** un'analisi delle caratteristiche tecniche dell'intervento rispetto al contesto storico e architettonico in cui si inserisce, valutandone l'integrazione con il bene tutelato;
- **Azioni verso il presidio:** una descrizione degli effetti pratici della soluzione sul sistema edilizio, ad esempio miglioramenti strutturali o di comfortambientale;
- **Tipologia di applicazione:** una classificazione che distingue tra applicazioni dirette, indirette o sperimentali;
- **Schema illustrativo:** in chiusura, viene fornito un piccolo schema tecnico o un disegno esplicativo che visualizza la soluzione proposta, evidenziandone i dettagli costruttivi o la configurazione conforme.

La lettura della scheda deve seguire l'ordine indicato, con un'attenzione particolare alla corrispondenza tra le informazioni contenute nella parte sinistra e destra. Questo approccio consente di collegare in modo coerente la descrizione analitica della soluzione ai suoi aspetti tecnici e normativi, offrendo una visione integrata e funzionale.



DISPOSITIVI CAPTAZIONE E.S.

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

INCOLORE

TIPOLOGIA DI APPLICAZIONE

POSIZIONAMENTO NELL'INTERA COPERTURA

ESPOSIZIONE NELLA FALDA SUD

II.4 L'esperienza di ricerca a Valencia: analisi e confronto con gli Smart Villages in Spagna

In linea con gli obiettivi della borsa di ricerca concessa dall'INPS, il periodo di studio a Valencia, Spagna, ha previsto la guida del professor Arturo Zaragozá Catálan presso la Real Academia de Bellas Artes de San Carlos de Valencia, con il supporto aggiuntivo del professor Rafael Marín Sánchez dell'Universitat Politècnica de València. Il periodo di ricerca, durato tre mesi da febbraio/marzo 2023 a giugno/luglio 2023, si è svolto secondo un piano stabilito con i docenti il 20 ottobre 2022, e ha consentito di identificare analogie e differenze tra l'area di Valencia e quella oggetto di studio in Italia.

Durante il primo mese, l'analisi si è concentrata sullo studio dell'architettura locale, i materiali e le tecniche costruttive più comuni in uso, per acquisire una comprensione approfondita del patrimonio edilizio interno valenciano. A questo si è affiancata una valutazione del comportamento tecnologico degli aggregati edilizi, volta a comprendere pienamente le peculiarità degli edifici oggetto di analisi. È stato così possibile condurre un confronto tra le soluzioni tipologiche e tecnologiche di Valencia e quelle italiane, individuando le soluzioni e i metodi di intervento per migliorare le il parco edilizio presente.

Il lavoro è stato supportato da verifiche periodiche con i tutor dell'Università di Palermo, della Real Academia de Bellas Artes de San Carlos e della Soprintendenza BB.CC.AA. della Provincia di Palermo, per sistematizzare le metodologie e l'approccio adottato. Il programma di ricerca è stato articolato in varie fasi, comprendenti lo studio delle aree interne di Valencia, l'analisi tipologica del patrimonio edilizio, l'indagine sulle tecnologie costruttive e i materiali storici, nonché l'approfondimento delle strategie di recupero, di efficientamento energetico e di adeguamento sismico. Questo ha permesso un confronto continuo tra il contesto italiano e quello valenciano, individuando strategie tecnologiche sostenibili applicabili a entrambi i patrimoni edilizi.

Il periodo all'estero ha rappresentato inoltre una risorsa cruciale per lo sviluppo delle Linee Guida per il Comune di Polizzi Generosa e dell'Atlante per il comprensorio madonita, favorendo l'identificazione di tecnologie e di strategie di recupero e efficientamento del patrimonio edilizio applicabili anche nell'area delle Madonie e in altri contesti del Mediterraneo.

Fig. II.4.1 | Comunità Valenciana ©InformagiovaniItalia, 2023

II.4.1 Inquadramento territoriale

Dal punto di vista territoriale, la città di Valencia, situata sulla costa orientale della Penisola Iberica, si distingue per la sua notevole diversità morfologica e geografica. Il paesaggio si articola tra una fascia pianeggiante e sabbiosa lungo la costa e, a ovest, la presenza di rilievi montuosi che fungono quasi da confine naturale con il resto della penisola. Questa suddivisione geografica crea una netta dualità nel territorio, distinguibile in due grandi fasce: una zona costiera e una più interna, che comprende le aree intermedie e montane o rurali (Eaude, 2019).

La costa valenciana si estende per circa 500 chilometri lungo il Mar Mediterraneo, includendo spiagge sabbiose di fama internazionale, come la Malvarrosa e l'Albufera, un'importante laguna costiera che rappresenta una delle zone umide più significative della Spagna. L'Albufera non è solo un'a-

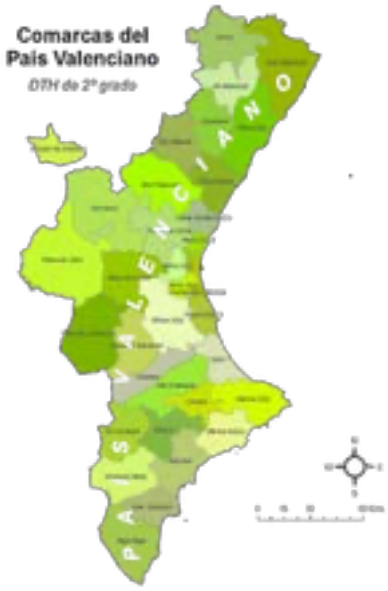


Fig. II.4.2 | Comarche Valenciane ©Wikimedia, 2023

Fig. II.4.2.1 | Edificio residenziale nel centro di Valencia ©Luisa Lombardo, 2023

Fig. II.4.2.2 | Dettaglio di Tapia Valenciana ©Luisa Lombardo, 2023

rea naturale protetta, ma anche un simbolo dell'identità locale, grazie alla produzione di riso utilizzato per la celebre paella valenciana. Questa interazione tra ambiente naturale e utilizzo antropico rende il territorio costiero un modello di convivenza tra tradizione agricola e turismo moderno.

La zona orientale si affaccia su un vasto porto, che gioca un ruolo fondamentale nell'economia regionale, sia come punto di attracco per navi turistiche sia come scalo commerciale strategico per il Mediterraneo, facilitando scambi commerciali con città portuali come quelle in Italia, Francia e Tunisia. Valencia è il quinto porto europeo per volume di traffico merci e il primo nel Mediterraneo, grazie anche a una rete infrastrutturale moderna che include collegamenti ferroviari ad alta velocità e un aeroporto internazionale (Caratozzolo, 2007).

Sul piano territoriale interno, Valencia è suddivisa in 34 *comarche*, le nostre provincie, ciascuna caratterizzata da elementi distintivi derivati dalla diversità del paesaggio e dalle tradizioni delle comunità locali. Le comarche interne, come Los Serranos o l'Alto Palancia, sono dominate da paesaggi montuosi e rurali, che contrastano con le aree urbane più densamente popolate della costa. Questa varietà geografica si riflette anche nelle economie locali: mentre la costa è fortemente orientata al turismo e al commercio, le aree interne si concentrano su agricoltura, allevamento e, in alcune zone, sulla lavorazione artigianale dei prodotti agricoli, come l'olio e il vino (Eaude, 2019).

La popolazione della regione di Valencia conta circa 5.005.737 abitanti, distribuiti su un'area di 685,43 km^2. La città stessa rappresenta il centro nevralgico di un'area metropolitana che contribuisce significativamente alla densità demografica della regione. Il clima, tipicamente mediterraneo, è temperato, con una temperatura media annuale di 18,3°C. Le minime si registrano a gennaio con 11,9°C, mentre i picchi di calore, già da febbraio, possono arrivare fino a 40°C, come accaduto nel febbraio 2024. In estate, agosto registra una temperatura media di 26,1°C, spesso con punte superiori ai 30°C; oggi è una delle città più calde del Mediterraneo, dopo Siviglia.

Le precipitazioni, pur concentrate prevalentemente in autunno, rivestono un ruolo chiave nella modellazione del paesaggio. Durante questi mesi, i fenomeni di "gota fría", eventi meteorologici intensi tipici della regione, possono causare alluvioni improvvise, con un impatto significativo sull'agricoltura e sulle infrastrutture. Nonostante ciò, le risorse idriche della regione sono ben gestite, grazie a una tradizione secolare che include i "tribunali delle acque", istituzioni di origine medievale ancora oggi operative per la risoluzione dei conflitti legati alla gestione dei canali irrigui (UrbiStat, 2024).

La combinazione di queste caratteristiche rende Valencia una regione dinamica e strategica, capace di integrare un passato ricco di tradizioni con le esigenze di uno sviluppo contemporaneo sostenibile.

II.4.2 Caratteristiche materico - costruttive

Pur avendo ottenuto, negli ultimi anni, alcuni titoli come città verde, accessibile, Valencia e la sua storia costruttiva hanno un legame indissolubile. In particolare, si evince come, sebbene le aree rurali e il centro città siano abbastanza distanzi, le peculiarità materico - costruttive adottate sono le medesime. Tale analisi è stata approfondita nel centro storico di Valencia condotta sotto la guida del Tutor del dottorato per poi comprendere ed analizzare ancora meglio l'edilizia di base costituente i piccolo *pueblos* dell'area valenciana. Il patrimonio architettonico della città si caratterizza per edifici residenziali e monumentali, con porte d'ingresso, in genere, a doppia altezza (Fig. 1), stalle al piano terreno e piani superiori nobili. La simmetria e la linearità dei prospetti sono costanti in tutto il centro storico. Gli edifici monumentali sono costruiti prevalentemente da struttura portante in conci di pietra squadrata e presentano, il più delle volte, corti interne (Fig.6) con tecniche costruttive tradizionali come bóvedas tabicadas, diffuse a Valencia e in tutta la Spagna e molto simili alle volte realine presenti nell'area delle Madonie (Benlloch, 1995). Questa tecnica, utilizza il laterizio per la manifattura di

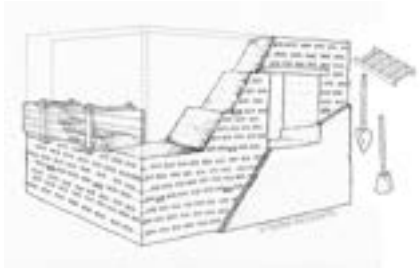


Fig. II.4.2.3 | Disegno di Tapia Valenciana ©Terra Incognita, 2023

edifici di minor pregio, e la pietra per quelli monumentali, raggiungendo il suo apice nelle architetture più maestose della città, come la Lonja de la Seta (*Fig. 7*) nel cuore cittadino.

Le *bóvedas tabicadas* sono, infatti, un elemento distintivo dell'architettura valenciana, con una ricca storia che risale all'epoca medievale. Si tratta di volte realizzate mediante la disposizione di tegole piane o curve (*Fig. 8*), disposte in corsi successivi e sovrapposte a secco, senza l'utilizzo di malta o centine (Albarran et al., 1885). Note per la loro leggerezza strutturale, combinata con un'elevata resistenza al peso e alle sollecitazioni, la tecnica costruttiva permette di realizzare diverse forme geometriche, come volte a botte, a crociera e cupole, adattandosi a diverse esigenze architettoniche (Moya Blanco, 1947). Il laterizio offre, inoltre, un buon isolamento termico, contribuendo a mantenere un clima interno confortevole negli edifici, con ottime proprietà fonoassorbenti, favorendo un ambiente acustico piacevole e una tessitura creata dalle tegole conferisce alle volte un'estetica unica e distintiva, arricchendo il valore architettonico degli edifici (Redondo, 2013).

Oltre alle bóvedas tabicadas, un altro esempio di tecnologia costruttiva storica largamente diffusa è la *tapia valenciana* (*Fig. 4*), una tecnica di costruzione tradizionale utilizzata nella regione di Valencia, in Spagna, per realizzare murature impiegando la terra cruda (Sanchis, 1926) a sacco. La tecnica prevede la compattazione di un impasto di terra argillosa, sabbia e

Fig. II.4.2.4 | Palazzo del Governo Valenciano ©Luisa Lombardo, 2023

Fig. II.4.2.5 | Llotja de la Seda ©Luisa Lombardo, 2023

Fig. II.4.2.6 | Esempio di Bovedas Tabicadas al centro di Valencia ©Luisa Lombardo, 2023

Fig. II.4.2.7 | Museo d'arte valenciana e fiamminga ©Luisa Lombardo, 2023

Fig. II.4.3.1 | Cattedrale di Valencia ©Luisa Lombardo, 2023

Fig. II.4.3.2 | Accessibilità residenziale ©Luisa Lombardo, 2023

Fig. II.4.3.3 | Accessibilità urbana ©Luisa Lombardo, 2023

acqua all'interno di una cassaforma chiamata "tapial" (Font et al. 1991) costituita da laterizio. La terra viene pressata manualmente o con l'ausilio di un battipalo, creando strati successivi fino a raggiungere l'altezza desiderata del muro (*Fig. 5*). La *tapia valenciana* utilizza solo materiali naturali e localmente disponibili, come l'argilla e la sabbia; per tali motivi può essere considerata una tecnica costruttiva vernacolare (Friedman, 1995). Questo la rende una tecnica di costruzione sostenibile con un basso impatto ambientale. I muri in *tapia valenciana* sono molto resistenti e duraturi. Possono durare per secoli, come dimostrano numerosi edifici storici nel centro storico di Valencia (Zaragozà, 2011). La terra cruda ha un'elevata inerzia termica (Keable, 1996) e questo rende i muri in *tapia valenciana* (*Fig. 5*) efficienti dal punto di vista energetico, contribuendo a ridurre il consumo di energia per il riscaldamento e il raffrescamento degli edifici. É una tecnica versatile che può essere utilizzata per realizzare diverse tipologie di murature, come muri portanti, divisorie e di recinzione (Lopez et al., 1996); può essere adattata a diverse forme e curvature, offrendo una grande libertà architettonica.

Oggi, numerosi cantieri edili risultano in corso d'opera sia nel centro storico che nella periferia di Valencia, tuttavia, se il centro tenta ancora di preservare le sue peculiari storiche caratteristiche costruttive, nelle aree periferiche la libertà compositiva degli edifici è maggiore, pertanto si evidenzia un netto cambio di registro dato da edifici molto moderni e con tecniche costruttive innovative e lontane dalle tecniche costruittive tradizionali. Il recupero dell'architettura tradizionale, tuttavia, rappresenta un punto di riferimento fondamentale per la città, che pone grande attenzione alla tutela e alla conservazione, applicando e valorizzando le tecniche costruttive storiche e promuovendo una tradizione costruttiva che non deve essere in alcun modo persa.

II.4.3 Esperienze di recupero e valorizzazione. Valencia città innovativa

Sebbene custode di peculiari tradizioni costruttive (Maldonado et al., 2002), Valencia è una città che nel tempo ha cercato di adattarsi alle esigenze odierne e promuovere il recupero e l'accessibilità residenziale e urbana, poiché tutti gli spazi urbani, sia privati che pubblici, sono progettati e recuperati al fine di essere utilizzati dalla pluralità di utenza. Negli ultimi anni, sono state implementate rampe e ascensori urbani (Fig. 2) per raggiungere, ad esempio, i numerosi parcheggi sotterranei, riducendo così la presenza di autovetture nel centro storico. Valencia ha, dunque, normalizzato il patrimonio architettonico alle esigenze di vita contemporanea allineandosi ai principi di *Design for All*. L'accessibilità è stata estesa anche e soprattutto ai complessi monumentali con l'installazione, ad esempio, di rampe in acciaio, per garantire ampia fruibilità al patrimonio culturale. Questi interventi si possono osservare in alcuni dei principali monumenti della città, simbolo di una Valencia capace di fondere il proprio passato storico con soluzioni tecnologiche innovative e, allo stesso tempo, distante dalle politiche italiane e di tutela che non consentono spesso e volentieri questa tipologia di interventi anche con materiali non affini. Un esempio significativo è la rampa collocata presso la Cattedrale di Valencia, dedicata all'Assunzione di Maria (Fig. 1).

Per favorire la comprensione da parte dei visitatori, tutti i musei e i complessi monumentali sono stati dotati, inoltre, di fruizione digitale tramite codici QR, consentendo l'accesso alle informazioni e alla fruizione del patrimonio storico, architettonico e culturale in diverse lingue. Un supporto audio/testuale in modo da rendere l'utente autonomo circa la possibilità non solo di esplorare, ma anche di conoscere e comprendere l'architettura locale in piena autonomia e tramite il proprio smartphone.

Valencia, negli ultimi anni, ha implementato, così come per l'Italia accadde con il Superbonus e l'Ecobonus, politiche di recupero del patrimonio costruito e di efficienza energetica, sfruttando le opportunità offerte dai bandi europei per l'efficientamento energetico e il recupero del patrimonio costruito. In particolare, sono stati approfonditi piani che si allineano alle direttive intraprese dall'Italia, tra questi il Piano RENHATA, il PREE

Fig. II.4.3.4 | Ascensore urbano ©2023, Luisa Lombardo

Fig. II.4.3.5 | Prototipo per l'aumento della superficie degli appartamenti di Valencia ©2023, Mira Comunitat Valenciana

Fig. II.4.3.6 | Pannelli fotovoltaici a Valencia ©2023, Krib

Fig. II.4.3.7 | Pareti verdi nel cimitero monumentale di Valencia ©2023, Luisa Lombardo

5000, l'IEEV.CV, il programma NEXT GENERATION e altri incentivi per l'acquisto e l'affitto di alloggi. Analizzandoli uno ad uno:

Il Piano Renhata, finanziato dalla Generalitat Valenciana, incentiva la riqualificazione energetica e la ristrutturazione degli edifici residenziali. I suoi obiettivi includono il miglioramento dell'efficienza energetica, la riduzione delle emissioni di CO_2, la promozione della sostenibilità ambientale e il miglioramento delle condizioni di vita degli abitanti. Si rivolge ai proprietari di edifici residenziali, agli amministratori di condominio e agli inquilini, con il consenso del proprietario, per interventi come l'isolamento termico, la sostituzione di infissi, l'installazione di impianti di riscaldamento e raffrescamento efficienti e interventi di ristrutturazione edilizia che migliorino l'accessibilità. Gli incentivi previsti comprendono contributi a fondo perduto, prestiti agevolati e detrazioni fiscali, richiedendo una domanda online sul sito web della Generalitat Valenciana.

Il PREE 5000 è un programma di riabilitazione energetica che promuove l'efficientamento degli edifici esistenti situati in comuni con meno di 5.000 abitanti che affrontano sfide demografiche come lo spopolamento. Gli interventi ammessi includono il miglioramento della copertura termica, la sostituzione di impianti termici con fonti rinnovabili e il miglioramento dell'efficienza energetica dell'illuminazione. Gli aiuti variano dal 50% per il miglioramento della copertura termica al 20% per l'efficienza energetica dell'illuminazione.

Negli ultimi anni, Valencia ha introdotto anche l'IEEV.CV, un documento obbligatorio per gli edifici residenziali nella Comunità Valenciana, che valuta lo stato di conservazione, le condizioni di accessibilità e l'efficienza energetica. Analogamente al Certificato APE in Italia, ha validità di 10 anni dalla presentazione telematica e fornisce informazioni sulle caratteristiche costruttive, lo stato di conservazione, le eventuali deficienze e le raccomandazioni per la manutenzione e la riqualificazione dell'edificio. Il Programma Next Generation, invece, è volto all'agevolazione per l'aquisto di immobili e per il reupero di immobili per i più giovani, gli under 35.

Tra le iniziative innovative, si distingue la Piattaforma digitale MIRA, volta a valorizzare e promuovere le buone pratiche nel recupero del patrimonio esistente, un *repository* online con tutti i progetti virtuosi, gli esiti dei concorsi di idee e le sperimentazioni in atto per migliorare le condizioni di abitabilità. Questo perchè il processo di recupero, soprattutto, in vista delle ridotte dimensioni delle case previste dalla normativa tecnica spagnola, richiede soluzioni non sempre congrue, pertano sono necessari interventi innovativi e tecnologicamente all'avanguardia. Coinvolgendo enti, aziende, studi di architettura e università valenciane, la piattaforma raccoglie dunque gli interventi validati dalla Soprintendenza, dai tecnici e dall'Real Academia de Bellas Artes de San Carlos de Valencia (Soprintendenza valenciana), contribuendo alla ricerca di buone pratiche di gestione e recupero del patrimonio edilizio esistente. Un esempio di innovazione riguarda l'ampliamento della superficie dei balconi mediante una struttura in acciaio e legno, consentendo un'area più estesa (*Fig. 13*), rispettando le limitazioni di sporgenza in Spagna (non oltre i 50 cm).

Il panorama energetico di Valencia sta vivendo una trasformazione significativa grazie all'adozione crescente delle comunità energetiche, supportate dalla legislazione spagnola del 2019. Il governo offre, infatti, incentivi come sovvenzioni, prestiti a tasso zero e detrazioni fiscali, creando un ambiente favorevole all'adozione di pratiche energetiche sostenibili. Comunità energetiche come El Cabanyal e Paterna sono già attive, anche se la presenza limitata di pannelli fotovoltaici nei grandi centri storici impedisce la diffusione generalizzata. Un esempio innovativo, rispetto a questa tematica, riguarda l'implementazione di una comunità energetica nel cimitero monumentale (*Fig. 14 e 15*), sfruttando le coperture dei forni crematori e degli ossari per produrre energia sostenibile, preservando nel contempo il patrimonio storico cittadino. Allo stesso modo la presenza di pareti verdi, che contribuisce all'estetica e alla qualità dell'aria.

Fig. II.4.3.8 | Territorio valenciano ©2023, Luisa Lombardo

Valencia si distingue anche per la sua *governance* virtuosa. Gli attori della comunità valenciana sono, infatti, coinvolti in modo attivo, con gruppi di lavoro sulla sostenibilità nel Consiglio Comunale e assistenza tecnica fornita dalla Fondazione Aguas de Valencia. Il Gruppo di lavoro sul turismo sostenibile, affiliato alla Fondazione Visit Valencia, si occupa, invece, di iniziative volte al calcolo dell'impronta di carbonio su 151 indicatori, miglioramento della qualità dell'aria e ripristino degli ecosistemi naturali e delle zone umide. Non è un caso se, dal 2024, Valencia è Capitale Verde Europea, riconoscendo l'impegno della città nella sostenibilità e nel superamento delle sfide ambientali attraverso un approccio collaborativo, un passo significativo verso un futuro energetico più sostenibile e consapevole in cui un ruolo decisivo è svolto dalla comunità.

II.4.4 I centri minori dell'entroterra valenciano

Il territorio di Valencia risulta diviso in tre aree principali: a nord Castellòn, al centro Valencia e a sud Alicante. L'area di Castellòn, in particolare, è stata attenzionata per la ricchezza delle sue piccole realtà rurali, come la municipalità di Morella e San Mateo, esplorando le peculiarità architettoniche e culturali di queste regioni. Tali considerazioni sono state effettuate in virtù della vicinanza delle peculiarità territoriali con il comprensorio Madonita.

L'area della *Setena*, altra area oggetto di studio, è costituita da sette villaggi nel Parco di Tinença de Benifassà, con un ricco patrimonio naturalistico, ed è stata anch'essa presa in considerazione per la sua familiarità con il Parco delle Madonie e i suoi 21 villaggi. L'area in questione è stata promossa e valorizzata tramite percorsi naturalistici volti alla comunicazione e al collegamento tra villaggi con denominatore comune la natura.

Il Parco Naturale di *Pereroles* e l'*Albufera*, famosa oltre che per la sua laguna e ai percorsi di valorizzazione attuati dagli stessi local, anche per la paella locale. Sono due esempi di beni naturalistici predominanti nel territorio. Nonostante la diminuzione della popolazione in queste aree, negli ultimi anni, sono in corso progetti per il recupero e l'efficientamento energetico, inclusi programmi europei e iniziative locali per migliorare le condizioni abitative e l'accessibilità.

Durante l'analisi dettagliata di alcuni pueblos di Valencia, tutti facenti parte dell'Allegato I relativo al Case Study Booklet, molti di essi sono stati oggetto del processo di digitalizzazione negli ultimi anni, soprattutto i pueblos più grandi come Morella e Xativa, a causa dell'incremento del flusso turistico. La presenza di numerosi castelli che caratterizza questi pueblos costituisce uno sprono per la valorizzazione e fruizione turistica, confermando il patrimonio monumentale come una delle principali componenti attrattive dei pueblos, anche perchè ben collegati con mezzi di trasporto come bus e treni. É possibile, anche, per i giovani under 30, ottenere un abbonamento gratuito per viaggi illimitati in treno per incentivare non solo l'uso del trasporto pubblico, ma soprattutto per muoversi con più facilmente, per studio o per lavoro, da e per Valencia proprio dai piccoli pueblos.

Oltre ai *pueblos*, custodi di architettura di grande pregio, similmente all'area madonita, il territorio rurale di Valencia è caratterizzato da beni isolati, come il riurau, la cascina, la baracca, il nevai e la cebera, rappresentanti di un patrimonio edilizio diffuso e ricco di tradizioni che caratterizza il paesaggio valenciano.

Il *riurau*, ad esempio, è un esempio significativo di architettura rurale tipica di Valencia, storicamente utilizzato per la lavorazione dell'uva, con caratteristiche architettoniche che si integrano armoniosamente con l'ambiente circostante. Analogamente, gli altri beni incarnano l'autenticità delle costruzioni rurali, ciascuna con peculiarità uniche e una storia radicata nella cultura valenciana. È interessante notare come questa architettura rurale valenciana possa in alcuni aspetti richiamare l'architettura del Geopark delle Madonie in Sicilia. Entrambi i contesti presentano una ricca diversità di edifici rurali, contribuendo a creare un paesaggio unico e strettamente legato alle attività agricole e alle tradizioni locali. Le similitudini possono risiede-

re nelle tecniche costruttive, nei materiali utilizzati e nell'integrazione delle strutture con l'ambiente naturale circostante, sono in egual maniera edifici vernacolari. Questa affinità architettonica tra Valencia e le Madonie in Sicilia sottolinea la ricchezza e la varietà delle tradizioni rurali europee diffuse in tutto il Bacino del Mediterraneo e in Europa. Entrambi i territori, pur mantenendo la propria identità culturale, mostrano una connessione intrinseca tra l'architettura e la vita rurale, evidenziando l'importanza di preservare e valorizzare questo patrimonio comune, caratterizzando il paesaggio.

A svolgere un ruolo cardine nella tutela e recupero del patrimonio edilizio sono gli innumerevoli manuali di recupero dei centri storici dei piccoli pueblos presenti nel territorio di Valencia, uno strumento ampiamente diffuso per il loro recupero e valorizzazione. In genere, il compito di costituirli è affidato proprio dalla Generalitat Valenciana ad alcuni architetti e professori dell'Università che si sono distinti nella tutela e nella valorizzazione di piccoli contesti territoriali e soprattutto nella pratica professionale dedita al recupero dell'architettura tradizionale.

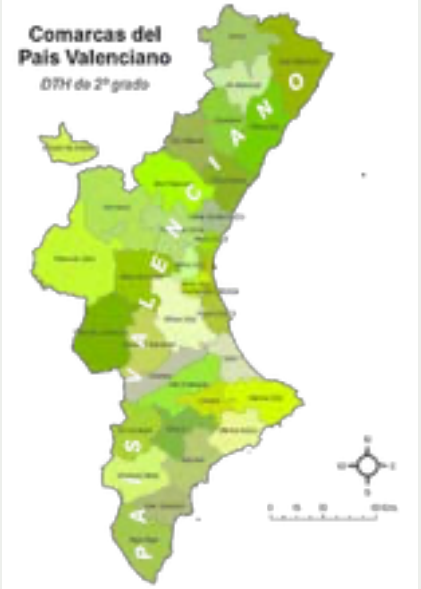
Anche per il caso di Valencia, analogamente a Polizzi Generosa, è stata effettuata una disamina territoriale volta alla comprensione immediata del territorio come di seguito riportato nelle schede.

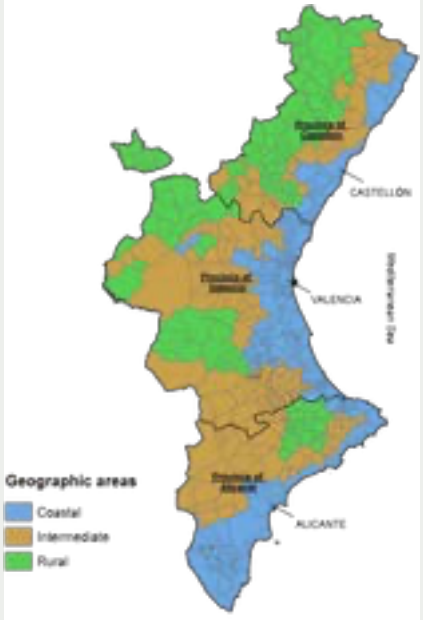
L'esperienza di ricerca a Valencia ha rappresentato un'opportunità straordinaria per approfondire lo studio del patrimonio edilizio e delle strategie di recupero adottate in un contesto culturale e geografico distante da quello italiano. Grazie alla guida di accademici di rilievo e all'approfondimento delle tecniche costruttive e delle politiche di efficientamento energetico locali, è stato possibile individuare similitudini e differenze rispetto al contesto siciliano.

Questa prospettiva comparativa ha permesso di arricchire il bagaglio di conoscenze con strumenti e strategie utili a comprendere le azioni più adeguate da intraprendere per il recupero e la valorizzazione delle aree interne delle Madonie. In particolare, l'approccio adottato a Valencia, caratterizzato dalla combinazione di tradizione e innovazione, dall'attenzione all'accessibilità e dalla promozione della sostenibilità, fornisce spunti applicabili al territorio madonita, anche in termini di *governance* e coinvolgimento della comunità locale. La collazione di dati e metodi raccolti durante i tre mesi di ricerca non si limita all'ambito tecnico, ma si estende alla definizione di una visione integrata per il rilancio delle aree interne. L'esperienza rappresenta quindi un passo fondamentale per definire linee guida concrete, capaci di coniugare la valorizzazione del patrimonio con le necessità del vivere contemporaneo, a vantaggio non solo delle Madonie, ma di altre realtà del bacino del Mediterraneo che affrontano sfide analoghe.

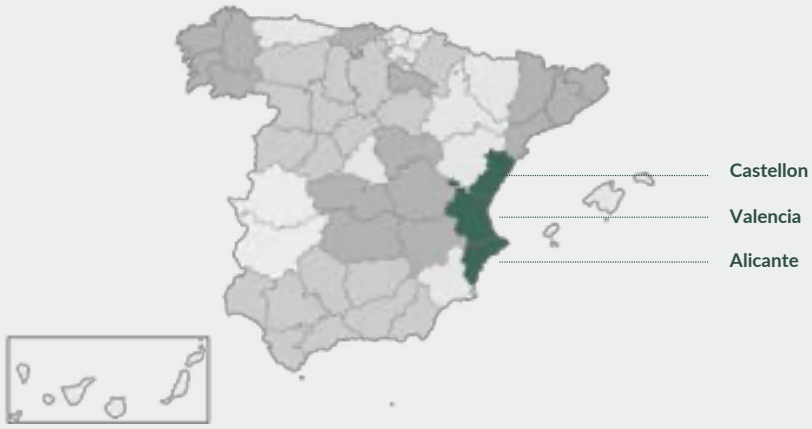
Fig. II.4.4.1 | Albufera a Valencia ©2023, Luisa Lombardo

VALENCIA

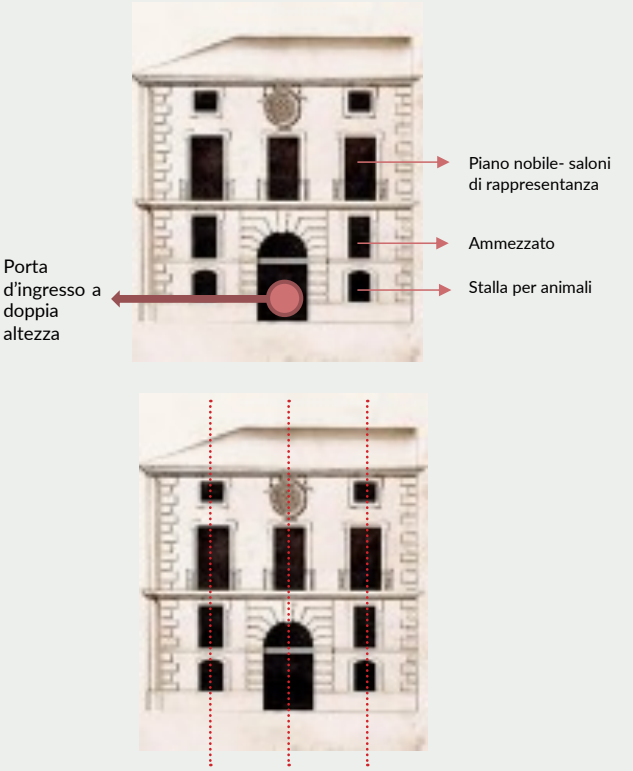




Posizione geografica	Est della Penisola Iberica
Morfologia	Pianeggiante con costa bassa e sabbiosa; rilievi montuosi a ovest
Suddivisione geografica	Due grandi strisce, una pianeggiante e una montuosa
Porto	Porto di grande importanza economica, punto di attracco per navi turistiche e scalo commerciale con il resto del Mediterraneo
Collegamenti commerciali	Ampie opportunità di scambio con città portuali come Italia, Francia, e Tunisia
Suddivisione interna	34 comarche, ciascuna con caratteristiche peculiari legate al paesaggio e alle comunità locali
Popolazione	Circa 5.005.737 abitanti
Superficie	685,43 km²
Clima	Temperato, con una temperatura media annuale di 18,3°C
Temperature	Minima in gennaio (11,9°C); Picchi di calore a febbraio (fino a 40°C nel 2024); Agosto media di 26,1°C con punte oltre i 30°C
Precipitazioni	Abbondanti in autunno, scarse in estate
Popolazione aree rurali	1.001.147 abitanti



EDILIZIA RESIDENZIALE



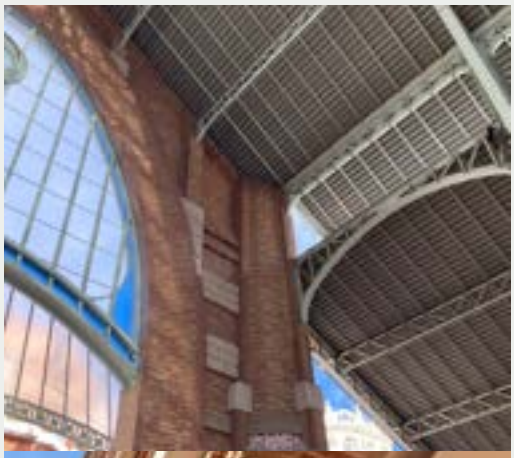
EDILIZIA MONUMENTALE

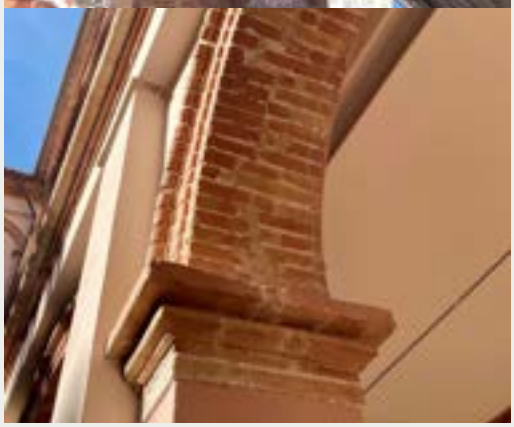
Sebbene Valencia sia oggi una città in cui la modernità ha dato impulso a interventi e costruzioni all'avanguardia, caratterizzate da soluzioni tecnologiche efficienti e innovative, il tessuto urbano conserva ancora una vasta testimonianza di architettura storica, in particolare nel suo affascinante centro storico.

Qui, la presenza di edifici di grande pregio architettonico (Fig. 1a) si manifesta nell'uso sapiente della pietra, che nei secoli ha cercato di riprodurre e talvolta esaltare le tecniche costruttive tradizionali. La pietra, intagliata con maestria, non solo richiama le tecniche edilizie diffuse nell'area, ma conferisce agli edifici una solidità e una bellezza senza tempo. Un elemento distintivo che accomuna molte delle costruzioni più antiche è la presenza di ampie corti centrali (Fig. 1b) interne, spazi che non solo avevano una funzione pratica di ventilazione e illuminazione, ma rappresentavano anche il cuore della vita domestica e sociale dell'epoca (Fig. 1c), conferendo a questi edifici una dimensione spaziale e simbolica particolarmente rilevante.

Questi esempi di architettura storica, dunque, offrono un contrasto suggestivo con le moderne strutture della città, creando un dialogo tra passato e presente che arricchisce il paesaggio urbano di Valencia e ne riflette la profonda stratificazione storica.

TECNICHE COSTRUTTIVE





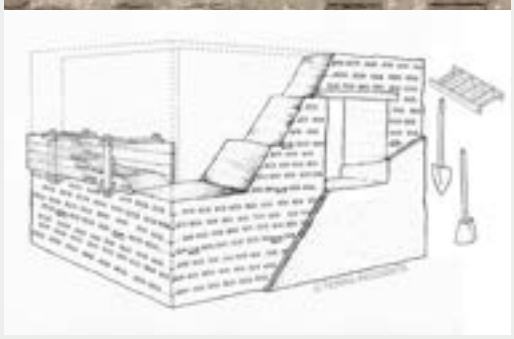
LATERIZIO

Il laterizio, grazie alle sue proprietà meccaniche, ha trovato largo impiego come muratura portante nella costruzione di edifici sia rurali che urbani. I mattoni di argilla cotta, disposti in file ordinate, venivano utilizzati per creare muri massicci e solidi, capaci di sostenere il peso delle strutture sovrastanti. Questo sistema di costruzione, oltre a fornire una buona resistenza meccanica, offriva eccellenti capacità di isolamento termico e acustico, particolarmente importanti nel clima caldo di Valencia.

L'uso della muratura portante in laterizio ha caratterizzato molte abitazioni tradizionali, ma anche edifici civili e religiosi di grande importanza, dimostrando la versatilità di questo materiale.

Un altro aspetto cruciale dell'uso del laterizio a Valencia riguarda la sua applicazione nella costruzione di archi e volte, elementi chiave nell'architettura mediterranea. Grazie alla capacità del laterizio di resistere a compressione, i costruttori valenciani hanno potuto realizzare archi e volte che permettevano di coprire ampi spazi senza necessità di travi o altri supporti verticali.

In particolare, le volte a crociera e gli archi a tutto sesto realizzati in mattoni sono diventati una caratteristica distintiva dell'architettura religiosa e civile della regione. I mattoni, spesso disposti in pattern precisi e regolari, consentivano la costruzione di soffitti monumentali che offrivano leggerezza e stabilità strutturale. Questo tipo di costruzione ha permesso di creare ambienti spaziosi, freschi d'estate e accoglienti in inverno, in linea con le esigenze climatiche del territorio.



TAPIA VALENCIANA

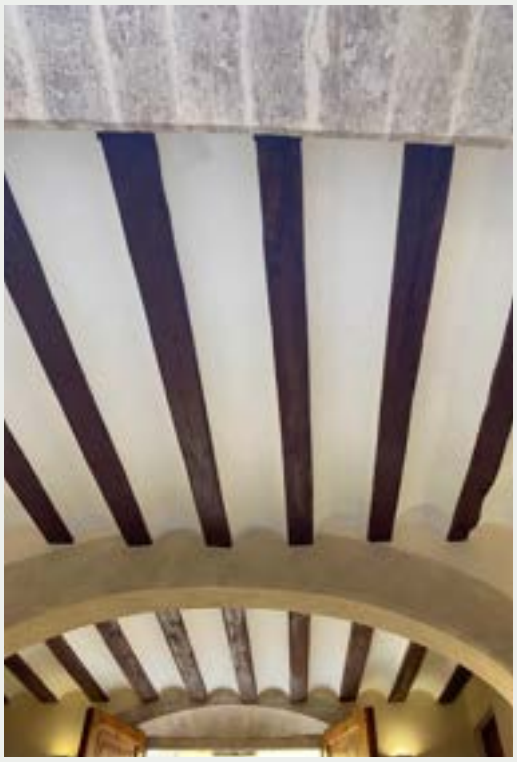
La *tapia valenciana* è una tecnica tradizionale di costruzione utilizzata nella regione di Valencia, caratterizzata dall'uso di materiali locali e naturali, come la terra cruda e la calce. Questa tecnica rientra nel vasto panorama dell'architettura vernacolare mediterranea, dove l'impiego della terra battuta (tapia) rispondeva a criteri di economia, sostenibilità e adattamento climatico.

Il processo costruttivo della Tapia Valenciana prevede la realizzazione di muri mediante l'uso di casseri di legno, all'interno dei quali veniva versata una miscela di terra, ghiaia, calce e, a volte, piccoli frammenti di pietra o ceramica. Questa miscela veniva successivamente compressa, strato per strato, attraverso la battitura, ottenendo così un muro solido e resistente. I muri realizzati con questa tecnica offrono un'ottima capacità di isolamento termico, mantenendo freschi gli interni durante le estati calde e proteggendo dagli sbalzi termici invernali.

La Tapia Valenciana non solo riflette un metodo costruttivo pratico e sostenibile, ma anche un'importante espressione della cultura costruttiva locale, profondamente legata alle risorse naturali del territorio. Ancora oggi è possibile osservare edifici storici in terra cruda nelle zone rurali e urbane della regione valenciana, testimoni di un sapere antico che si tramanda da generazioni.

Negli ultimi anni, vi è stato un rinnovato interesse verso l'uso della Tapia Valenciana, in linea con l'attenzione crescente verso tecniche di costruzione sostenibili e a basso impatto ambientale. L'architettura contemporanea ha iniziato a rivalutare questa tecnica tradizionale, combinandola con materiali e tecnologie moderne per creare edifici che rispettano sia l'ambiente che il patrimonio culturale.

TECNICHE COSTRUTTIVE

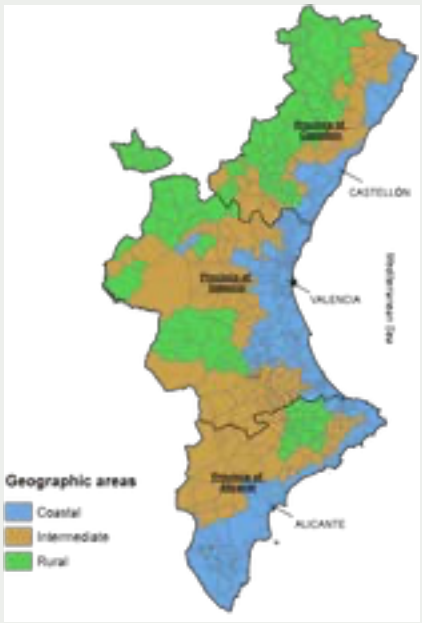


BOVEDAS TABICADAS

Tra le tecniche che esprimono al meglio l'ingegno nell'uso del laterizio e della pietra vi sono le *bóvedas tabicadas*. Questa tecnica, originaria della Spagna e diffusasi ampiamente a Valencia, consiste nella costruzione di volte sottili e leggere mediante l'uso di mattoni in laterizio. Il grande vantaggio delle bóvedas tabicadas è la rapidità di esecuzione e l'efficienza economica, poiché consentono di creare strutture con pochi materiali, ma con un'elevata resistenza. Le bóvedas tabicadas sono particolarmente apprezzate per la loro capacità di coprire grandi spazi senza necessità di armature complesse. I mattoni vengono fissati con una malta veloce e asciutta, consentendo una posa rapida e sicura. Questa tecnica è stata utilizzata sia per edifici religiosi che per abitazioni private, dove si cercava di combinare estetica e funzionalità. Il risultato finale è una volta elegante e resistente, che, sebbene sottile, offre grande stabilità strutturale. Questo metodo si è dimostrato particolarmente utile nelle case rurali, nelle fabbriche e nei magazzini, dove era necessario coprire ampie superfici con costi ridotti.

Il successo delle *bóvedas tabicadas* fu tale che, nel tempo, gli artigiani valenciani iniziarono a sperimentare l'utilizzo di pietra intagliata al posto del laterizio per la costruzione di volte. Questa evoluzione permise di realizzare strutture ancora più resistenti e durature, mantenendo la leggerezza e l'eleganza, caratteristiche di questa tecnica. La pietra intagliata, oltre a garantire una maggiore longevità rispetto ai mattoni di laterizio, conferiva un aspetto monumentale agli edifici, particolarmente apprezzato nelle costruzioni religiose e nei palazzi nobiliari.

PUEBLOS



L'area di Castellón, colma di pueblos valenciani, si trova sulla costa orientale della Spagna a Nord di Valencia, e comprende una ricca varietà di paesaggi che spaziano dalle montagne interne alle coste del Mar Mediterraneo. La provincia è conosciuta sia per le sue città costiere, sia per i centri minori pittoreschi dell'entroterra, offrendo una combinazione di storia, cultura e bellezze naturali.
La provincia di Castellón può essere divisa in tre principali aree geografiche (vedi *Fig. 1*):

- **Costa:** L'area costiera si affaccia sul Mediterraneo ed è nota per le sue spiagge e località turistiche come Benicàssim e Peñíscola, famosa per il castello medievale che si affaccia sul mare.
- **Area Centrale:** Qui si trovano città come Castellón de la Plana, capoluogo della provincia, e una serie di pueblos e storici centri minori che combinano un ricco patrimonio architettonico e culturale con un crescente sviluppo turistico.
- **Entroterra Montuoso:** A ovest si trova un territorio montuoso caratterizzato da piccoli borghi medievali, riserve naturali e paesaggi rurali incontaminati. Quest'area è particolarmente apprezzata per le escursioni, il turismo rurale e i villaggi con un forte legame con la storia, come Morella, Culla, e Vilafamés.

Oltre all'area di *Castellón*, la più autentica, ma anche la più ricca di pueblos, ancora non totalmente raggiungibili la porzione ad ovest del territorio di Valencia è caratterizzata da tantissime aree rurali immerse in aree verdi e protette.

L'area della *Setena*, altra area oggetto di studio, è costituita da sette villaggi nel Parco di Tinença de Benifassà, con un ricco patrimonio naturalistico, ed è stata presa in considerazione per la sua familiarità con il Parco delle Madonie e i suoi 21 villaggi, allo stesso modo il Parco Naturale di Pereroles. Nonostante la diminuzione della popolazione in alcune di queste aree negli ultimi anni, sono in corso progetti per il recupero e l'efficientamento energetico, inclusi programmi europei e iniziative locali per migliorare le condizioni abitative e l'accessibilità. La presenza di numerosi castelli in ottime condizioni ogni giorno attira un gran numero di visitatori, confermando il patrimonio monumentale come una delle principali attrattive dei pueblos, spesso ben collegati con mezzi di trasporto come bus e treni.

Oltre ai *pueblos*, simile all'area madonita, il territorio rurale di Valencia è caratterizzato da architetture rurali uniche, come il riurau, la cascina, la baracca, il nevai e la cebera, rappresentanti di un patrimonio edilizio diffuso e ricco di tradizioni che caratterizza il paesaggio valenciano contribuendo a creare un paesaggio unico e strettamente legato alle attività agricole e alle tradizioni locali.

Questa affinità architettonica tra Valencia e il Geopark delle Madonie in Sicilia sottolinea la ricchezza e la varietà delle tradizioni rurali europee. Entrambi i territori, pur mantenendo la propria identità culturale, mostrano una connessione intrinseca tra l'architettura e la vita rurale, evidenziando l'importanza di preservare e valorizzare questo patrimonio comune.

L'analogia del territorio valenciano e quello delle Madonie aiuta la comprensione del territorio riconoscendo in entrambe le aree, Madonie e Valencia, la possibilità di confronto e uno stesso principio di tutela e valorizzazione.

ARCHITETTURA RURALE

Fig. 1 | RIURAU

Fig. 2 | CEBERAS

Fig. 3 | CASCINA

Fig. 4 | BARACCA

Fig. 5 | NEVAIO

L'architettura rurale di Valencia è caratterizzata da una varietà di strutture che riflettono l'adattamento delle comunità agricole al clima, alle risorse naturali e alle attività economiche locali. Questi edifici rispondono principalmente a esigenze legate all'agricoltura, all'allevamento e alla conservazione dei prodotti. Di seguito, una descrizione tecnica di alcune tipologie di edifici rurali tipici della regione:

1. Riurau: struttura agricola tradizionale tipica della regione di Valencia, utilizzata principalmente per l'essiccazione dell'uva passa. Architettonicamente, è un edificio aperto su uno o più lati, sostenuto da arcate in pietra o mattoni, con un tetto a falde generalmente realizzato in tegole. La forma aperta consente una buona ventilazione, fondamentale per l'essiccazione dell'uva senza esporla direttamente alla pioggia o al sole troppo intenso. Rappresenta un elemento distintivo dell'economia agricola storica della regione, in particolare nelle zone di produzione vinicola.

2. Ceberas: costruzione tradizionale utilizzata per la conservazione dei cereali e dei prodotti agricoli secchi. Queste strutture sono generalmente costruite con l'incannucciato o bambù, con aperture ridotte per evitare l'ingresso di umidità e animali. La loro funzione principale è quella di proteggere il raccolto da intemperie e parassiti, mantenendo un ambiente secco e ventilato. Le ceberas sono spesso integrate nelle masías o fattorie rurali, e il loro design rispecchia l'attenzione alla conservazione delle derrate alimentari in ambienti climaticamente difficili.

3. Cascina: struttura rurale multifunzionale. Serve sia come abitazione per le famiglie contadine che come centro operativo per l'attività agricola. Architettonicamente, è un edificio di grandi dimensioni, spesso costruito in pietra o mattoni, con tetti a doppia falda ricoperti da tegole. Le cascine sono strutturate su più livelli: il piano terra è generalmente dedicato agli animali e alle attrezzature agricole, mentre il primo piano ospita le stanze della famiglia. Le cascine rappresentano un'architettura agricola robusta, in grado di ospitare molteplici attività e adattarsi alle esigenze agricole del contesto. Sono paragonabili alle masserie siciliane.

4. Baracca: struttura tradizionale molto comune nelle zone paludose o costiere della regione, utilizzata principalmente dai pescatori o dagli agricoltori. Si tratta di edifici di piccole dimensioni, costruiti con materiali semplici come canne, fango e legno. Il tetto a doppia falda, spesso rivestito in paglia, è uno degli elementi distintivi delle baraccas, che offrono riparo dalle intemperie con un'architettura minimalista, legata alle risorse naturali locali. Pur essendo strutture semplici, le baraccas sono profondamente radicate nel paesaggio rurale e costiero di Valencia, rappresentando un modo di vivere sostenibile e in armonia con l'ambiente.

5. Nevaio: Il nevaio è una costruzione destinata alla conservazione della neve, tipica delle aree montane della regione di Valencia, come la Sierra Calderona. Queste strutture erano utilizzate fino al XIX secolo per raccogliere e conservare neve e ghiaccio durante l'inverno, che veniva poi utilizzato in estate per conservare alimenti o come refrigerante. I nevai sono di solito costruiti in pietra, con pareti spesse per mantenere basse le temperature interne, e sono dotati di aperture per facilitare l'immagazzinamento e la rimozione del ghiaccio. Architettonicamente, si tratta di edifici semplici ma ingegnosi, che sfruttano la coibentazione naturale per prolungare la conservazione della neve.

ACCESSIBILITÀ

Fig. 1 | Accessibilità allargata a Valencia ©Luisa Lombardo, 2023

Fig. 2 | Parcheggi sotterranei ©Luisa Lombardo, 2023

Fig. 3 | Accessibilità allargata in un tabacchi a Valencia ©Luisa Lombardo, 2023

Fig. 4 | Parcheggi sotterranei a Pça. de la Reina Valencia ©Luisa Lombardo, 2023

Valencia è una città fortemente orientata all'accessibilità, poiché gli spazi urbani, sia pubblici che privati, sono progettati per essere fruibili da una vasta gamma di utenti. Negli ultimi anni, sono stati realizzati numerosi interventi per migliorare l'accessibilità, tra cui la conversione di scale in rampe e l'installazione di ascensori urbani, che facilitano l'accesso ai numerosi parcheggi sotterranei e contribuiscono alla riduzione della presenza di veicoli nel centro storico. Sebbene si presti molta attenzione al recupero compatibile, Valencia ha talvolta sacrificato la coerenza degli interventi con il contesto storico e architettonico, nell'ottica di rendere fruibile il patrimonio edilizio e la città a una platea più ampia.

L'accessibilità è stata estesa anche ai complessi monumentali, dove sono state installate rampe in acciaio inox per garantire la fruizione del patrimonio culturale valenciano. Al fine di agevolare la comprensione dei visitatori, tutti i musei e i complessi monumentali offrono sistemi di fruizione digitale tramite codici QR, che permettono l'accesso alle informazioni in diverse lingue. Inoltre, ogni complesso è dotato di supporti audio e testuali per l'esplorazione dei beni monumentali in oltre cinque lingue, inclusa la lingua valenciana.

STRATEGIE DI RECUPERO

1. Piano RENHATA (2020)
- **Descrizione:** Piano di riqualificazione energetica e ristrutturazione degli edifici residenziali.
- **Obiettivi:** Migliorare l'efficienza energetica, ridurre le emissioni di CO2, promuovere la sostenibilità ambientale, migliorare le condizioni di vita.
- **Destinatari:** Proprietari di edifici residenziali, amministratori di condominio, inquilini (con consenso del proprietario).
- **Interventi ammessi:** Isolamento termico, sostituzione infissi, installazione di impianti di riscaldamento/raffrescamento efficienti, interventi di accessibilità.
- **Incentivi:** Contributi a fondo perduto, prestiti agevolati, detrazioni fiscali.
- **Modalità di richiesta:** Domanda online sul sito della Generalitat Valenciana.

2. PREE 5000 (2015)
- **Descrizione:** Programma di riabilitazione energetica per edifici in comuni con meno di 5.000 abitanti.
- **Obiettivi:** Promuovere l'efficienza energetica in aree a rischio di spopolamento.
- **Interventi ammessi:** Miglioramento copertura termica, sostituzione impianti termici con fonti rinnovabili, miglioramento dell'efficienza energetica dell'illuminazione.
- **Incentivi:** Aiuti dal 50% (miglioramento copertura termica) al 20% (illuminazione).

3. IEEV.CV (Informe de Evaluación de Edificios de Viviendas de la Comunitat Valenciana) (2020)
- **Descrizione:** Documento obbligatorio per edifici residenziali che valuta conservazione, accessibilità ed efficienza energetica.
- **Validità:** 10 anni.
- **Informazioni:** Caratteristiche costruttive, stato di conservazione, deficienze, raccomandazioni per manutenzione e riqualificazione.

4. Piattaforma MIRA (2023)
- **Descrizione:** Piattaforma volta a promuovere le buone pratiche nel recupero del patrimonio esistente.
- **Attori coinvolti:** Enti, aziende, studi di architettura, università.
- **Finalità:** Contribuire alla ricerca di buone pratiche di gestione del patrimonio edilizio, convalidati da soprintendenza e tecnici.

5. Comunità energetiche
- **Descrizione:** Iniziative per creare comunità energetiche sostenibili.
- **Incentivi:** Sovvenzioni, prestiti a tasso zero, detrazioni fiscali.
- **Esempi:** Comunità energetiche attive a El Cabanyal e Paterna, installazione di pannelli fotovoltaici su forni crematori e ossari nel cimitero monumentale di Valencia.

6. Governance della sostenibilità
- Descrizione: Iniziative collaborative sulla sostenibilità promosse dal Consiglio Comunale.
- Attori coinvolti: Gruppi di lavoro, Fondazione Aguas de Valencia, Fondazione Visit Valencia.
- Obiettivi: Calcolo dell'impronta di carbonio, miglioramento qualità dell'aria, ripristino ecosistemi naturali.
- Riconoscimento: Capitale Verde Europea dal 2024.

7. Innovazioni architettoniche
- **Descrizione:** Interventi innovativi come l'ampliamento dei balconi mediante strutture in acciaio e legno, rispettando le limitazioni di sporgenza (50 cm).
- **Esempio:** Implementazione di pareti verdi per la qualità dell'aria. Uso di murales acchiappa smog.

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Fig. I | Scorci di Polizzi Generosa © Simone Carta, 2023

Capitolo III

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Capitolo III
Abstract

IT

Il terzo Capitolo della presente tesi propone una sistematizzazione delle strategie per il recupero, la salvaguardia e la valorizzazione del territorio delle Madonie, promuovendo un approccio *smart* che integra innovazione tecnologica e digitale con soluzioni per un'economia *green* e circolare. Attraverso l'adozione di strategie di innovazione sociale e la partecipazione attiva della comunità, il capitolo si prefigge di definire operativamente le modalità per la creazione di *Smart Villages*, coniugando tradizione e innovazione, integrando la comunità, la *governance*, il recupero del patrimonio costruito e la tecnologie insieme alla digitalizzazione. La ricerca individua soluzioni concrete e mirate, delineando un quadro strategico che include l'implementazione di tecnologie avanzate per migliorare l'efficienza dei servizi, facilitare la comunicazione e promuovere la sostenibilità ambientale incentivando l'uso responsabile delle risorse, supportano la produzione locale e riducono l'impatto ambientale.

In particolare, si propone, come strumento operativo, le Linee guida per il recupero e la valorizzazione del Comune di Polizzi Generosa, volto ad aiutare l'amministrazione, tecnici e cittadini nella comprensione dei caratteri identitari dell'architettura di base e nella proposizione di soluzioni tecnologiche compatibili.

L'approccio adottato sottolinea l'importanza di un coinvolgimento attivo della comunità nelle decisioni e nelle iniziative, così come delle altre componenti utili a fare funzionare il sistema proposto promuovendo la creazione di legami sociali e un'identità e una progettualità condivisa. Una volta individuate queste soluzioni, il capitolo mira a definire linee guida e best practices per l'attuazione del criterio *smart* nel contesto delle Madonie. Si propone la creazione di protocolli di gestione per gli *Smart Villages*, con indicazioni pratiche per implementare in modo efficace e sostenibile le soluzioni individuate.

E, infine, business plan specifici, per l'implementazione, il mantenimento e il monitoraggio delle soluzioni nel lungo periodo. In sintesi, il terzo capitolo costituisce il nucleo operativo della tesi, fornendo una guida pratica e dettagliata per la creazione e la gestione degli *Smart Villages* nelle Madonie, unendo visione innovativa, sostenibilità e concretezza applicativa.

EN

The third Chapter of this thesis proposes a systematic approach to the recovery, safeguarding, and enhancement of the Madonie territory, promoting a smart approach that integrates technological and digital innovation with solutions for a green and circular economy. By adopting social innovation strategies and fostering active community participation, the chapter aims to define the operational framework for creating Smart Villages, combining tradition and innovation while integrating community, governance, built heritage recovery, technology, and digitalization.

The research identifies concrete and targeted solutions, outlining a strategic framework that includes the implementation of advanced technologies to improve service efficiency, facilitate communication, and promote environmental sustainability. This framework encourages the responsible use of resources, supports local production, and reduces environmental impact.

In particular, the chapter proposes Guidelines for the Recovery and Enhancement of the Municipality of Polizzi Generosa as an operational tool to assist administrators, technicians, and citizens in understanding the identity characteristics of vernacular architecture and proposing compatible technological solutions.

The adopted approach emphasizes the importance of active community involvement in decision-making and initiatives, as well as the integration of other components necessary to make the proposed system function effectively. It promotes the creation of social bonds and a shared identity and planning vision.

Once these solutions are identified, the chapter aims to establish guidelines and best practices for implementing the smart approach in the context of the Madonie. It proposes the creation of management protocols for Smart Villages, providing practical instructions for effectively and sustainably implementing the identified solutions.

Finally, specific business plans are proposed for the implementation, maintenance, and long-term monitoring of these solutions. In summary, the third chapter constitutes the operational core of the thesis, providing a practical and detailed guide for the creation and management of Smart Villages in the Madonie, uniting innovative vision, sustainability, and practical application.

ES

El tercer Capítulo de esta tesis propone una sistematización de estrategias para la recuperación, la salvaguardia y la valorización del territorio de las Madonie, promoviendo un enfoque inteligente que integra la innovación tecnológica y digital con soluciones para una economía verde y circular. A través de la adopción de estrategias de innovación social y la participación activa de la comunidad, el capítulo se propone definir de manera operativa los métodos para la creación de Smart Villages, conjugando tradición e innovación e integrando comunidad, gobernanza, recuperación del patrimonio construido, tecnología y digitalización.

La investigación identifica soluciones concretas y específicas, delineando un marco estratégico que incluye la implementación de tecnologías avanzadas para mejorar la eficiencia de los servicios, facilitar la comunicación y promover la sostenibilidad ambiental. Este marco incentiva el uso responsable de los recursos, apoya la producción local y reduce el impacto ambiental.

En particular, se propone como herramienta operativa las Directrices para la Recuperación y Valorización del Municipio de Polizzi Generosa, destinadas a ayudar a la administración, los técnicos y los ciudadanos a comprender los caracteres identitarios de la arquitectura vernácula y proponer soluciones tecnológicas compatibles.

El enfoque adoptado subraya la importancia de la implicación activa de la comunidad en las decisiones e iniciativas, así como de otros componentes necesarios para hacer funcionar eficazmente el sistema propuesto, promoviendo la creación de lazos sociales y una identidad y planificación compartidas.

Una vez identificadas estas soluciones, el capítulo busca definir directrices y mejores prácticas para la implementación del enfoque inteligente en el contexto de las Madonie. Se propone la creación de protocolos de gestión para los Smart Villages, con indicaciones prácticas para implementar de manera eficaz y sostenible las soluciones identificadas.

Por último, se proponen planes de negocio específicos para la implementación, el mantenimiento y el monitoreo a largo plazo de estas soluciones. En resumen, el tercer capítulo constituye el núcleo operativo de la tesis, proporcionando una guía práctica y detallada para la creación y gestión de Smart Villages en las Madonie, uniendo visión innovadora, sostenibilidad y aplicabilidad práctica.

STRATEGIE DI RECUPERO, SALVAGUARDIA E VALORIZZAZIONE DEL TERRITORIO LOCALE ATTRAVERSO UN APPROCCIO SMART

Nel precedente capitolo sono stati esaminati gli *Smart Villages* e le politiche per le aree interne, dalle iniziative nazionali strutturali agli interventi di micro-scala, evidenziando gli strumenti a supporto delle piccole comunità e le strategie d'intervento. Numerosi studi dell'area, negli ultimi anni, hanno cercato di studiare le dinamiche e i processi legati alle piccole comunità rurali. Questi processi, come evidenziato da Scoones, si sviluppano in due ambiti: quello delle politiche e quello della sussistenza, dove le scelte politiche possono favorire alcuni gruppi e svantaggiare altri (Scoones, 2015). Sottolinea anche la necessità di indagare la "scatola nera" delle istituzioni e delle politiche pubbliche[1].

Fraser, d'altro canto, enfatizza l'importanza di ottenere riconoscimento e promuovere la partecipazione per raggiungere l'emancipazione dei cittadini, avviando un processo di *empowerment* della cittadinanza (Fraser et al., 2003). La partecipazione attiva alla vita della comunità e la capacità di rivendicazione politica sono essenziali per il benessere individuale (Chambers, 1997; Duflo, 2012). In questo contesto, è fondamentale comprendere il ruolo delle comunità locali nel ricreare connessioni e progettualità. Come sottolineato da Chambers, le comunità non sono solo portatrici d'interesse, ma co-creatori dello sviluppo, sfidando l'approccio imposto dall'alto che prevaleva durante il periodo fordista (Chambers, 1983; Meloni e Uleri, 2021).

Seguendo questa linea, Scoones riprende Chambers per delineare un cambiamento di paradigma nello sviluppo rurale[2]. Egli chiede: *"Le conoscenze di chi contano davvero? Quali strategie di sussistenza vengono prese a modello quando si elaborano politiche d'intervento?"* (Scoones, 2015; Chambers, 1983). È in quest'ottica che la sperimentazione descritta in questo capitolo mira a entrare nei micro-processi, lavorando a partire dalle comunità per fornire risposte concrete alla *governance*, e dunque alle aree interne, utilizzando approcci innovativi e sostenibili.

La SNAI, negli ultimi anni, ha promosso, seppur in minima parte, il protagonismo delle comunità locali, sfidando la chiusura di alcune realtà locali che ostacolano l'innovazione (Barca et al., 2014). La strategia attribuisce alla comunità locale il compito di trasformare le proprie specificità in progetti, valorizzando l'operato di soggetti innovatori che, sebbene a volte operanti in isolamento, sono connessi a reti sovra-territoriali. Un'analisi dei documenti strategici approvati fino al 2020 evidenzia come la parola "Comunità" sia centrale, pur assumendo un carattere romantico e idealizzato, come sottolineato da DeFilippis (2008). Si parla più di una nuova comunità che di una forma preesistente, per la quale è necessario costruire processi "volontari e aperti" capaci di creare nuove identità (Manzini, 2018).

La definizione di comunità di McMillan e Chavis (1986) sottolinea l'importanza dei legami sociali tra individui diversi, impegnati in azioni comuni in contesti locali. Tuttavia, questa definizione non esplora il potenziale delle comunità nei processi di sviluppo. La letteratura presenta due visioni opposte: una che celebra la comunità come centro delle iniziative sociali, e l'altra che ne critica l'efficacia politica (DeFilippis et al., 2006). Defilippis (2006) propone una comprensione più sfumata, vedendo la comunità come

[1] *"[...]si è scelto di prestare attenzione alle questioni che hanno a che fare con il potere e con la politica, e con le relazioni sociali e politiche che li sottendono. Questo vale sia che ci si riferisca ai processi globali mediati dai regimi nazionali che ai micro- processi politici che regolano le relazioni tra i vari nuclei familiari come anche all'interno di ciascuno di essi. Tali processi determinano quali strategie di sussistenza possono essere concretamente perseguite e quali sono invece negate in partenza, per cui è fondamentale analizzare le istituzioni, le organizzazioni e le politiche pubbliche dalle prospettive più differenti. Ciò significa andare oltre i ristretti approcci economicistici per analizzare i fattori sociali e culturali che spingono le persone ad agire in un modo piuttosto che in un altro e che influenzano il corso degli eventi, determinando dove e perché si verificano[...]"* (Scoones, 2015).

[2] *"[...] vi è un bisogno impellente di "invertire" il pensiero dello sviluppo, perché non capovolgerlo del tutto? Cosa accadrebbe se prendessimo sul serio le sfide e gli stimoli che provengono dal mondo reale? Come sarebbe guardare il mondo attraverso gli occhi di un "contadino", di un pastore, di un pescatore, di un commerciante, di un venditore ambulante, di un bracciante, o, per dire le cose come stanno, di qualcuno che, tra le numerosissime attività che si è soliti intraprendere nei contesti rurali, ne pratica al contempo più di una? Sicuramente le cose apparirebbero molto diverse da quelle che sono. [...]"* (Scoones, 2021)

un prodotto dei suoi contesti più ampi, ma anche come arena per il cambiamento sociale. La comunità, quindi, è vista come uno spazio politico in cui si può attuare un cambiamento significativo.

Olivetti definisce la comunità come la sede dell'elaborazione politica e della mediazione sociale, un'entità indipendente che non necessita di partiti (Olivetti, 2013). Questo approccio, sebbene radicale, può essere reinterpretato come una risposta pragmatica alle sfide contemporanee. Le comunità non sono entità statiche, ma capaci di evolversi e rispondere ai bisogni, come evidenziato da Cocco et al. (2019), ma anche creare opportunità nel territorio. Le esperienze di cooperative di comunità e iniziative di gestione condivisa dei beni comuni, ad esempio, spesso avviate da piccoli gruppi, dimostrano come si possano creare risposte strutturate ai bisogni locali, generando nuove prospettive in termini di relazioni e opportunità lavorative, ma soprattutto di impatto sociale[3].

In Sardegna le cooperative di comunità sono nate in risposta a sfide locali, con il supporto delle amministrazioni comunali, come nel caso di Fluminimaggiore e Ollolai (Mori e Sforzi, 2018); attività ancora non molto nota ed esplorata in Sicilia. Tuttavia, molte politiche continuano a essere calate dall'alto, con scarsa partecipazione cittadina, a differenza di quanto accade in Europa, dove il senso di comunità e l'attivismo per la rigenerazione dei luoghi sono molto più radicati e creano legami e progetti.

Quello delle cooperative di comunità è solo uno dei tanti esempi che può essere intrapreso a livello locale, una delle tante strategie possibili per il recupero e la valorizzazione dei piccoli contesti rurali.

Oggi, la sostenibilità e la valorizzazione dei centri minori sono obiettivi prioritari a cui una piccola comunità deve avvicinarsi, ma allo stesso tempo è anche vicina proprio perchè si opera in contesti ben conservati e già sostenibili di per se. Per affrontare questa sfida, tuttavia, è necessario ridefinire la "teoria del valore", adottando un approccio che integra qualità del contesto, progettazione sostenibile e concretezza tecnica, tecnologica e fattiva, in modo che gli aspetti economici, ambientali e sociali siano centrali per la riqualificazione del territorio e in sinergia con gli obiettivi sostenibili dell'Agenda 2030[4] (*Fig. 1*).

Gli *Smart Villages* rappresentano, dunque, una transizione verso comunità rurali che adottano tecnologie digitali e soluzioni sostenibili, migliorando la qualità della vita e promuovendo lo sviluppo economico, sociale e ambientale. Puntano a creare sinergie tra il patrimonio culturale e naturale e l'innovazione, valorizzando la comunità attraverso una *governance* partecipativa volta alla determinazione di strategie e obiettivi in equilibrio col si-

Fig. III.1 | SGDs per le aree rurali ©Luisa Lombardo, 2024

[3] La misurazione dell'impatto sociale è un processo complesso che mira a valutare il cambiamento generato dalle attività di un'organizzazione sulle condizioni di vita delle persone. Il processo proposto si articola in sei fasi lineari che rendono comprensibile la valutazione sia per le organizzazioni profit che per quelle sociali. La prima fase prevede la definizione dell'ambito di analisi, ovvero stabilire quali aspetti verranno considerati e quali esclusi dalla valutazione, tenendo conto delle risorse e del tempo a disposizione. Il secondo passo riguarda la mappatura e il coinvolgimento degli *stakeholder*, essenziale per identificare chi ha un interesse diretto nei risultati della valutazione e ottenere dati rilevanti da questi gruppi. La comprensione del processo di cambiamento costituisce la terza fase, in cui si definisce in che modo le attività dell'organizzazione hanno influenzato la realtà sociale.

Successivamente, nella quarta fase, avviene la misurazione e la scelta degli indicatori. In questa fase, è cruciale selezionare metriche che rispecchino con precisione gli esiti e gli impatti del progetto. La quinta fase si concentra sull'attribuzione dell'impatto, ossia determinare in che misura i cambiamenti osservati siano effettivamente riconducibili alle attività dell'organizzazione e non ad altri fattori esterni. Infine, la sesta fase riguarda la comunicazione dei risultati e l'apprendimento, con l'obiettivo di diffondere i risultati della valutazione e integrarne le lezioni apprese nel miglioramento continuo delle attività future.

Un aspetto importante da considerare è il contesto in cui si opera, poiché la valutazione dell'impatto è influenzata da variabili esterne, come la situazione socio-economica dei beneficiari o la presenza di altre organizzazioni attive sullo stesso fronte. Inoltre, per ottenere risultati efficaci, è necessario stabilire se l'analisi sarà previsionale (ex-ante), svolta prima dell'inizio del progetto, valutativa in itinere, durante la realizzazione, oppure ex-post, una volta concluso il progetto, per esaminare l'efficacia complessiva dell'intervento. La catena del valore dell'impatto (impact value chain) è uno strumento logico utile a rappresentare il legame tra input, attività, output, outcome e impatti, e consente di monitorare e comprendere come un progetto produce i cambiamenti desiderati.

In questo processo, risorse e tempo sono spesso limitazioni chiave che ostacolano il raggiungimento degli obiettivi prefissati. Gestire con attenzione questi vincoli, attraverso una pianificazione accurata, consente di ottimizzare i risultati della misurazione e garantire una valutazione attendibile dell'impatto sociale generato. (Impronta Etica. (2016). Linee guida per la misurazione dell'impatto sociale. https://www.improntaetica.org/wp-content/uploads/2016/08/Linee-Guida-Impatto_def.pdf [Ultimo accesso: 13 settembre 2024])

[4] Per ale aree interne, in particolare, si pensi agli obiettivi n°7, 8, 9, 10, 11, 12, 13, 15, 17 già esplicitati alla fine dell'Allegato N.2 "Altante per le soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie.

stema in cui operano.

Si fondano su principi chiave quali inclusione, sostenibilità e innovazione che rispetta la tradizione e la ribalta al futuro. Questi principi si traducono in azioni pratiche come la diffusione della banda larga, la digitalizzazione dei servizi pubblici e l'uso di tecnologie avanzate come l'intelligenza artificiale e l'IoT per ottimizzare la gestione delle risorse e migliorare la qualità della vita. Economia *green* e circolare, produzione locale, recupero, riuso, riciclo, accessibilità (fisica e digitale), design inclusivo per uno sviluppo territoriale resiliente e per comunità intelligenti e resilienti (Delle Cave, 2024).

Oltre a questo l'efficienza energetica, l'adeguamento sismico e l'analisi delle caratteristiche tecniche dell'edilizia storica si presentano come temi fondamentali per immaginare e ripensare l'edilizia di base che caratterizza questi piccoli contesti rurali. Tali priorità sono evidenziate, a titolo d'esempio, nella proprosta dell'Atlante e delle Linee Guida per il Comune di Polizzi Generosa e in egual maniera, per analogia o contrasto, possono essere trasposte in altri contesti rurali.

Garantire al patrimonio edilizio standard abitativi elevati è uno dei pilastri degli *Smart Villages*. Le tecnologie avanzate permettono di ridurre l'impatto ambientale degli edifici e migliorare il benessere dei cittadini, monitorando in tempo reale i consumi energetici e contribuendo alla riduzione delle emissioni di gas serra. (Lombardo, Colajanni, Campisi, 2024).

Tutte queste attività, tuttavia, hanno come priorità lo sviluppo del turismo, che rimane pur sempre uno dei maggiori pilastri in grado di favorire un introito in termini economici. Il richio, tuttavia, è che questo non deve in alcun modo diventare l'unico motore dell'economia locale, ma venga inserito in un contesto più ampio di valorizzazione delle risorse del territorio; questo per evitare fenomeni di turistificazione che movificherebbero l'essenza di villaggi e contesti ben conservati come i piccoli paesi dell'entroterra.

Guardando all'iter formativo nella gestione degli *Smart Villages*, dunque, opportuno provvedere a degli step precisi e all'analisi approfondita del territorio, che sia conoscitiva e volta all'individuazione dei punti di forza, debolezza, opportunità e minaccia presenti nel territorio. Effettuare, come fatto per il comparto madonita, un'analisi SWOT, questionari e sondaggi consentono di identificare in modo preciso le esigenze specifiche e le opportunità di miglioramento del contesto locale. Questa fase preliminare fornisce una base solida per l'individuazione delle priorità, dei bisogni, e delle risorse presenti o necessarie per sviluppare un progetto di successo. Accanto a ciò, è essenziale promuovere la collaborazione interdisciplinare, coinvolgendo professionisti provenienti da vari settori, come urbanisti, ingegneri, economisti e sociologi, nonché università ed enti di ricerca. Un approccio olistico permette di integrare competenze diverse, assicurando che le soluzioni siano non solo sostenibili, ma anche realizzabili nel lungo termine.

Un altro elemento cruciale nella gestione degli *Smart Villages* è la costruzione di solide *partnership* pubblico-private. La collaborazione tra il settore pubblico e quello privato consente di accedere a competenze specifiche e investimenti strategici, contribuendo alla creazione di un sistema di dati condivisi che mira a raggiungere obiettivi comuni. Questo approccio rafforza la capacità di implementare soluzioni innovative e garantire la sostenibilità economica del progetto. Linee guida, *best practices*, *business plan* e protocolli di gestione, insieme al monitoraggio periodico, sono altri strumenti che uno *Smart Village* deve tenere in considerazione per lo sviluppo.

In questo contesto, l'adesione ai principi di progetti come il Piano Nazionale di Ripresa e Resilienza (PNRR) è una priorità, tuttavia, come per tutti i fondi europei, è fondamentale mantenere le competenze aggiornate per rispondere alle nuove dinamiche e alle esigenze emergenti, sia a livello comunitario che globale, andando oltre l'Agenda 2030 e il *Green Deal* e considerando la possibilità di accedere a quanto più fondi e progetti possibili per ampliare il parco di soluzioni possibili per il territorio.

In contesti ben conservati (Associazione dei Comuni Virtuosi, 2014), come quello delle Madonie, la valorizzazione e la tutela da parte di enti di

tutela come la Soprintendenza, infine, estesa sia ai centri storici che al paesaggio, fungono da principi guida per contesti rurali all'interno di Geopark UNESCO o territori naturali di grande valore non solo per il territorio, ma soprattutto per l'umanità. Questi principi e iter, nonché tematiche da sviluppare, garantiscono che ogni innovazione sia in linea con i protocolli e le normative per la salvaguardia del patrimonio culturale e naturale, con un'impegno costante verso soluzioni sostenibili.

Questo percorso di crescita variegato integra tecnologie avanzate con il rispetto per la tradizione, proiettando il territorio verso un futuro sostenibile, inclusivo e ricco di nuove opportunità; non è rimanere legati al passato, ma cercare di trasporlo e proiettarlo al futuro.

Il principale obiettivo che va oltre il progetto di uno *Smart Villages* in un singolo paese madonita resta tuttavia è la creazione di un *network* di villaggi intelligenti, un sistema interconnesso che promuova lo sviluppo sostenibile a livello locale e che, gradualmente, si estenda dal singolo comune ai comprensori (Bobbio, 2004). Al centro della visione futura in network non è altro che la creazione di una piattaforma di scambio, dove i villaggi intelligenti possono condividere esperienze, idee e soluzioni da replicare in altri contesti, una piattaforma ideale in grado di fornire strumenti adeguati per la tutela e la valorizzazione dei territori. Non si tratta, infatti, della creazione di uno SV, ma di promuovere e contribuire la formazione di villaggi uniti, collaboranti e promotori di iniziative condivise. Tale piattaforma non solo rafforza la collaborazione, ma crea anche sinergie tra le comunità, favorendo l'apprendimento reciproco e la crescita secondo il principio cui *"insieme si è più forti"*. Attraverso questo *network*, ogni villaggio beneficia delle migliori pratiche degli altri, ma soprattutto ogni villaggio, con le sue peculiarità, può contribuire a colmare le lacune dell'altro, mutuo sussidio e coprogettazione, accelerando i processi di innovazione e adattamento alle sfide locali.

Un elemento cruciale di questo approccio è la valorizzazione dell'ecosistema locale: ogni villaggio è incoraggiato pertanto a sviluppare e sostenere iniziative in linea con le esigenze specifiche del proprio territorio, alla propria vocazione, creando un ambiente in cui l'innovazione prospera e si integra organicamente nel tessuto sociale e culturale senza sconvolgerlo. Tale approccio garantisce che le tecnologie siano implementate in modo pertinente, rispondendo alle sfide locali e che non vi siano forzature e soluzioni improprie.

Gli interventi proposti sono concepiti come modelli scalabili, adattabili non solo alle realtà siciliane ma anche in contesti nazionali ed europei, rispettando principi e obiettivi chiave in linea con le politiche dell'Unione Europea, la metodologia proposta è volta alla diffusione a larga scala del processo di creazione di *Smart Villages*.

La trattazione si conclude, poi, fornendo un supporto concreto alla realtà analizzata, così come ad altri contesti per analogia o contrasto. Si promuoveranno, infatti, strumenti pratici per il recupero tecnologico e compatibile del territorio nonché modelli di business, tarati per i piccoli comuni, per progettare consapevolmente. A concludere questo percorso Linee guida, Besta practices, Business Plan e Protocolli di gestione per uno sviluppo sostenibile dei territori.

Tutti questi strumenti sono pedissequamente descritti in questo capitolo con l'obiettivo di delineare un percorso condiviso e pragmatico per lo sviluppo di *Smart Villages* nel contesto Madonita seguendo i parametri di tutela e conservazione, recupero del patrimonio esistente, aderenza alla normativa, devono tuttavia adottare un percorso virtuoso e conseguire *goals* come da schema fornito in *Fig. 2*.

Nel dettaglio, in questi mesi è stata anche elaborata una mappa che trae spunto dalle rappresentazioni degli *Smart Villages* presenti nel mondo, in particolare in Svezia, e al loro metodo di rappresentazione, individuando strategie e opportunità territoriali che possono aiutare i vari contesti a mantenere uno status di "attualità" promuovendo le caratteristiche territoriali (Ahmadi, 2023) e un percorso condiviso in cui le tecnologie convergono nel

percorso di sostenibilità. Tale mappa, è stata calata nel contesto madonita, individuando per ciascun comune appartenente al comprensorio diverse strategie *smart* da applicare, come per le linee guida di Polizzi Generosa.

La mappa metro (*Fig. 3*) elaborata per la strategia madonita di *Smart Village* si ispira ai tradizionali schemi delle metropolitane presenti nel mondo. In particolare, essa si sviluppa in tre fasi distinte: innanzitutto, identifica i centri delle Madonie, mappandoli con precisione all'interno del territorio. In secondo luogo, collega questi centri attraverso una rete di percorsi *smart* e tecnologici, tutti orientati verso il binario centrale della sostenibilità. Infine, per ogni tematica, la mappa propone un percorso specifico da seguire per il raggiungimento degli obiettivi *smart*. I punti di intersezione o le fermate intermedie rappresentano le tappe necessarie per conseguire i parametri definiti per gli *Smart Villages;* questo un primo approccio per delineare orientamenti e percorsi da intraprendere e perseguire.

Fig. III.2 | Strategie e opportunità. ©Luisa Lombardo, 2024

La figura mostra nello specifico le 6 componenti da tenere in considerazione al fine di ottenere uno Smart Village, nel dettaglio, ciascuna componente, ha un ruolo fondamentale utile allo sviluppo dei criteri smart possibili nei piccoli comuni come quelli delle Madonie.

Fig. III.3 | Mappa Smart Villages del Parco delle Madonie ©2024, Luisa Lombardo

La figura illustra, analogamente a quanto osservato in alcuni villaggi definiti smart in Europa, una mappa metodologica concepita per raggiungere criteri smart nel territorio madonita, ovvero all'interno del Parco delle Madonie. L'obiettivo è identificare le specifiche strategie da attuare. Lo schema, ispirato al design della metropolitana di Londra, è strutturato per analizzare e condividere strategie operative su più livelli, tutti convergenti nel binario principale, rappresentato in verde, dedicato alla sostenibilità.

Descrizione

Per integrare e adattare idealmente le esperienze di successo relative agli Smart Villages rilevate, è stata elaborata una rappresentazione grafica specifica per l'area delle Madonie, utilizzando la tecnica della "London Underground".
Tale rappresentazione, fondata sugli studi di caso analizzati, offre una visione chiara degli Smart Villages e delinea con maggior precisione tutti gli obiettivi a cui ambisce la ricerca.
Si propone, infatti, di collegare l'area delle Madonie a strategie tecnologiche e innovative da perseguire su diverse linee d'azione (ciascuna delle quali afferisce ad uno o più Comuni delle Madonie), tutte convergenti verso l'obiettivo primario, evidenziato con la linea verde e più spessa, della sostenibilità.

Legenda

Linea d'azione principale

Linee d'azione secondarie

Fermate = Steps da raggiungere

Intersezioni = Steps raggiungibili in collaborazione

NOME DEL COMUNE Comune afferete al Comprensorio madonita

SOSTENIBILITÁ

GOVERNANCE
LAVORO
ACCESSIBILITÁ
BUSINESS
SALUTE
MOBILITÁ
TURISMO
COMUNITÁ ENERGETICHE
SICUREZZA
DIGITALIZZAZIONE
ISTRUZIONE
FINANZIAMENTI

III.1 Gli attori per il funzionamento di uno Smart Village

Come delineato nel paragrafo precedente, il percorso per essere uno *Smart Village* non è semplice e richiede, in primis, la costituzione di un sistema in grado di supportare tutti gli steps successivi. Il concetto di *Smart Village* ruota, infatti, attorno all'integrazione di diversi attori che, con il loro contributo complementare, consentono al territorio di crescere in modo sostenibile, valorizzando il patrimonio esistente e rispondendo ai bisogni locali attraverso soluzioni innovative e condivise.

Tantissime sono state in questi anni le possibilità offerte da ricerche da tutto il mondo sulla percezione e il funzionamento degli *Smart Villages* (Darwin et al., 2020), tuttavia, tale Ricerca vuole soffermarsi sull'importanza del recupero del costruito e sulla consapevolezza che un sistema integrato di attori e di soluzioni possano essere da monito per creare una nuova tipologia di SV basato sulla consapevolezza che, l'integrazione tra tradizione e innovazione possano coesistere e siano da spronto per il suo perfetto ed quilibrato funzionamento determinando risultati sostenibili a breve e lungo termine.

Per costruire una struttura solida è necessario, un organismo che risulti altrettanto efficace e integrato, è utile considerare, dunque, due sfere d'intervento fondamentali: la Componente Sociale e Partecipativa e la Componente Tecnologica e Patrimoniale. Queste due sfere riflettono un doppio approccio che considera da un lato il capitale umano e la partecipazione attiva della comunità tutta e, dall'altro, l'utilizzo di tecnologie avanzate, della digitalizzazione e l'attenzione al recupero, alla valorizzazione e alla tutela del patrimonio.

Componente Sociale e Partecipativa

La componente sociale e partecipativa è il nucleo umano e relazionale dello *Smart Village*, cruciale per favorire un senso di appartenenza e cooperazione all'interno della comunità locale (Iaione et al., 2022). Essa si suddivide in due sottocategorie essenziali:

- **comunità:** La dimensione comunitaria si concentra sul coinvolgimento attivo dei cittadini nei processi decisionali e nella vita quotidiana del villaggio/paese. In questa ottica, la comunità non è solo un insieme di individui, ma una rete sociale coesa e collaborativa (Armeni et al., 2021), dove la partecipazione e la cooperazione sono incentivati per rafforzare il legame identitario e per generare un senso di appartenenza collettiva. In un modello di *Smart Village*, la comunità può e deve essere coinvolta attraverso strumenti o processi partecipati o formazione di cooperative di qualsiasi genere (energetiche o di comunità), le quali, oltre a stimolare l'economia locale, favoriscono il senso di *ownership* verso i progetti e le iniziative condivise. Questi strumenti sono fondamentali per creare occupazione locale, valorizzare le risorse e assicurare la sostenibilità a lungo termine.
- **governance:** La *governance* rappresenta l'elemento di coordinamento, amministrazione e gestione all'interno dello *Smart Village*. Essa include sia le istituzioni locali sia le amministrazioni, e il suo ruolo primario è quello di facilitare un'interazione trasparente e costruttiva con la comu-

nità (Donato et al., 2017). Una buona *governance* è caratterizzata dalla capacità di ascolto attivo dei bisogni della popolazione e dall'integrazione delle istanze locali nelle politiche pubbliche. La trasparenza, l'inclusività e la responsabilità sono principi essenziali che guidano le azioni di *governance*, le quali devono mirare a costruire fiducia, rafforzare la coesione sociale e supportare le attività economiche e sociali promosse dalla comunità stessa. In sostanza, la *governance* rappresenta la regia delle risorse e delle azioni strategiche che permettono di concretizzare gli obiettivi di sviluppo di uno smart village. Oltre a questo, la *governance* ha il ruolo di recepire le esigenze riscontrate e tradurle in progetti e azioni programmatiche sia con progetti europei che con qualsiasi tipo di strumento a disposizione.

Componente Tecnologica e Patrimoniale

La componente tecnologica e patrimoniale si concentra, invece, più sui risultati, sulla modernizzazione dei servizi e la tutela del patrimonio architettonico, storico e culturale, combinando tradizione e innovazione per garantire che il progresso sia in perfetta armonia con l'identità locale e compatibile con il patrimonio costruito. Questa componente è strutturata nelle seguenti aree:

- **tecnologia e digitalizzazione:** L'uso delle tecnologie è un aspetto fondamentale per migliorare l'efficienza e l'accessibilità dei servizi pubblici e per facilitare la comunicazione e l'interazione tra comunità e *governance*. In un contesto di *Smart Village*, la digitalizzazione consente di ridurre la distanza tra cittadino e amministrazione, permettendo una gestione più flessibile e trasparente delle risorse. L'integrazione di soluzioni digitali, come le piattaforme online per l'accesso ai servizi o i sistemi di monitoraggio per la gestione delle risorse ambientali, contribuisce a ottimizzare l'uso delle risorse e a migliorare la qualità della vita. Allo stesso modo, le tecnologie applicate al patrimonio edilizio rende il parco edilizio attuale e affine ai bisogni contemporanei. Questo approccio tecnologico promuove una "Smart *Governance*" che sfrutta l'innovazione per rispondere in maniera efficiente e sostenibile alle esigenze della popolazione locale.
- **recupero e valorizzazione del patrimonio materiale e immateriale:** Un altro aspetto cruciale dello *Smart Village* è rappresentato dal recupero e dalla valorizzazione del patrimonio, che include non solo la tutela dell'architettura e la conservazione dei caratteri identitari locali, ma anche la natura e il patrimonio intangibile (Alfonso Gonzales, 2018). La preservazione e il recupero del patrimonio architettonico, storico, culturale e ambientale contribuiscono a rafforzare l'identità locale, rendendo le tradizioni e i valori del territorio parte integrante dello sviluppo contemporaneo (Donders, 2018). La valorizzazione del patrimonio intangibile, come usi, costumi e pratiche tradizionali, è un elemento fondamentale per garantire che il progresso tecnologico sia accompagnato dalla continuità culturale (Mottese, 2019). Questa prospettiva valorizza l'autenticità del territorio e assicura che la modernizzazione non comprometta, ma piuttosto arricchisca, le peculiarità e le tradizioni locali.

L'interconnessione tra queste due componenti non è solo auspicabile ma è assolutamente necessaria per lo sviluppo equilibrato e sostenibile di uno *Smart Village*. La partecipazione attiva della comunità (Watson, 2010), sostenuta da una *governance* attenta e trasparente, rappresenta una base solida per l'implementazione di innovazioni tecnologiche che, a loro volta, contribuiscono a migliorare l'efficienza e la qualità dei servizi, rendendo la vita più agevole per i residenti. Inoltre, la tecnologia è funzionale alla tutela del patrimonio: attraverso sistemi di monitoraggio e gestione digitale, è possibile proteggere e valorizzare le risorse architettoniche, ambientali e culturali (Carayannis et al., 2010), permettere di conoscerle e farle conoscere, trasmetterle alla pluralità di utenza anche e soprattutto non indigena,

garantendo che la crescita culturale, economica e sociale sia sostenibile e rispettosa dell'identità locale.

Uno *Smart Village* deve, quindi, essere inteso come un ecosistema integrato, in cui l'innovazione tecnologica si fonde armoniosamente con la valorizzazione del capitale umano e del patrimonio locale, creando un modello di sviluppo che sia inclusivo, resiliente e in grado di rispondere efficacemente alle sfide contemporanee delle aree rurali e interne.

All'interno di uno *Smart Village*, la comunità riveste un ruolo cruciale nella valorizzazione e tutela del patrimonio, essendo il principale soggetto responsabile della sua conservazione e promozione. La sensibilizzazione e l'educazione della popolazione locale si rivelano fondamentali per garantire un coinvolgimento consapevole e duraturo (Giuseppe, 2021). Attraverso iniziative culturali, attività formative e *workshop*, la comunità viene e deve essere informata sull'importanza del proprio patrimonio, promuovendo una consapevolezza diffusa che incoraggia il rispetto e la protezione delle risorse locali (Gould, 2018). Parallelamente, è essenziale stimolare una partecipazione attiva da parte dei cittadini nelle fasi di progettazione e realizzazione delle iniziative (Micciarelli, 2022). I meccanismi di *co-design*, così come i sondaggi e i *focus group*, permettono alla popolazione di contribuire direttamente alla pianificazione, facendo emergere bisogni, idee e proposte (Steen, 2013). Questo approccio genera un senso di appartenenza e responsabilità condivisa, che stimola la comunità a prendersi cura dei beni patrimoniali del territorio. La creazione di cooperative comunitarie ed energetiche rappresenta un ulteriore strumento per rafforzare questo processo. Queste cooperative, infatti, permettono una gestione autonoma e condivisa delle risorse, contribuendo allo sviluppo economico locale e promuovendo una forma di economia sociale basata sulle risorse patrimoniali stesse.

Sul piano della *governance*, l'elaborazione di politiche di tutela è un passaggio essenziale per garantire la protezione del patrimonio (Watson et al., 2010). Le istituzioni, responsabili della gestione delle risorse, devono predisporre regolamenti adeguati, strumenti e supporti alla progettazione, incentivare le iniziative di tutela e offrire supporto finanziario, oltre che trovare gli opportuni finanziamenti, per favorire progetti di valorizzazione a livello locale. Queste politiche mirano a creare un quadro normativo inclusivo e orientato alla sostenibilità, nel quale il patrimonio possa essere protetto e valorizzato in maniera continuativa e possa ricevere sussidi per il mantenimento. Un altro elemento centrale riguarda la collaborazione tra settore pubblico e privato, che consente di integrare competenze e risorse esterne in un'ottica di gestione sostenibile e innovativa. Il coinvolgimento di attori locali e aziende fornisce nuove risorse economiche e tecniche, contribuendo alla riuscita dei progetti di valorizzazione, mentre il monitoraggio e la valutazione costanti delle iniziative permettono di analizzare l'efficacia degli interventi e di apportare eventuali migliorie. Attraverso un processo di valutazione trasparente, la *governance* può documentare l'impatto delle azioni intraprese, incentivando ulteriormente il coinvolgimento della comunità e dei partner locali così come è importante valutare il supporto di Università ed enti del terzo settore per migliorare la gestione di progetti anche più grandi.

Dal punto di vista tecnologico, la digitalizzazione del patrimonio rappresenta una strategia efficace per aumentarne l'accessibilità e promuovere un'interazione diretta e consapevole con il pubblico (Yu et al., 2024). La creazione di archivi digitali, mappe interattive e applicazioni dedicate sono solo alcuni esempi che consentono alla comunità e ai turisti di esplorare e conoscere il patrimonio locale in maniera innovativa, trasformando l'esperienza in un'opportunità di apprendimento immersivo. Allo stesso modo, mappare e monitorare sia ambientalmente che strutturalmente il patrimonio attraverso sensori avanzati permette di preservare lo stato dei beni architettonici, culturali e naturali, anticipando eventuali danni derivanti dall'usura o da condizioni climatiche avverse e agire per tempo sul patrimonio (United Nations, 2023). Gli interventi di restauro e manutenzione dei beni

materiali devono rispettare tecniche tradizionali e utilizzare materiali locali per garantire la coerenza storica e culturale degli interventi, minimizzando l'impatto ambientale e preservando l'autenticità del patrimonio (Ashley et al., 2001). Questo tipo di monitoraggio riduce la necessità di interventi invasivi, garantendo una tutela proattiva e sostenibile. L'uso di piattaforme digitali per la partecipazione civica, invece, permette, inoltre, di facilitare il dialogo tra amministrazione e comunità, rendendo più semplice per i cittadini segnalare problemi, proporre idee e partecipare a consultazioni pubbliche in maniera inclusiva.

Infine, la valorizzazione del patrimonio materiale e immateriale costituisce il cuore di ogni intervento in un contesto di smart village. La promozione delle tradizioni e delle competenze locali è essenziale per mantenere viva l'identità culturale della comunità, favorendo la trasmissione di conoscenze e pratiche alle nuove generazioni attraverso scuole, laboratori e manifestazioni culturali. Tali iniziative sono solo alcuni esempi che rafforzano il legame tra la comunità e il proprio territorio, assicurando che le conoscenze e le abilità locali possano perdurare nel tempo così come la creazione di eventi e percorsi culturali rappresenta una strategia efficace per far conoscere il patrimonio e attrarre un turismo consapevole e sostenibile, capace di rispettare e valorizzare l'identità locale. Attraverso l'organizzazione di itinerari tematici ed eventi dedicati, il patrimonio diventa non solo un motivo di attrazione turistica, ma anche un'opportunità per rafforzare il senso di appartenenza della comunità (Rachele, 2022).
Queste azioni, intraprese in sinergia dai diversi attori, favoriscono uno sviluppo sostenibile dello *Smart Village*, nel quale la comunità, la *governance*, la tecnologia e il patrimonio stesso si integrano per promuovere una tutela efficace delle risorse locali. Il risultato è un sistema coordinato che non solo preserva l'identità culturale e ambientale del territorio, ma genera anche valore economico e sociale, costruendo un futuro più consapevole e rispettoso delle proprie radici.

Nel prossimo paragrafo si andrà ad individuare non solo, nello specifico, le componenti di uno *Smart Village*, insieme ai loro ruoli e responsabilità, ma anche quello che viene identificato come metodo per individuare lo *Smart Village*.

Fig. III.1.1 | Petralia Sottana ©Letizia Cardinali, 2024

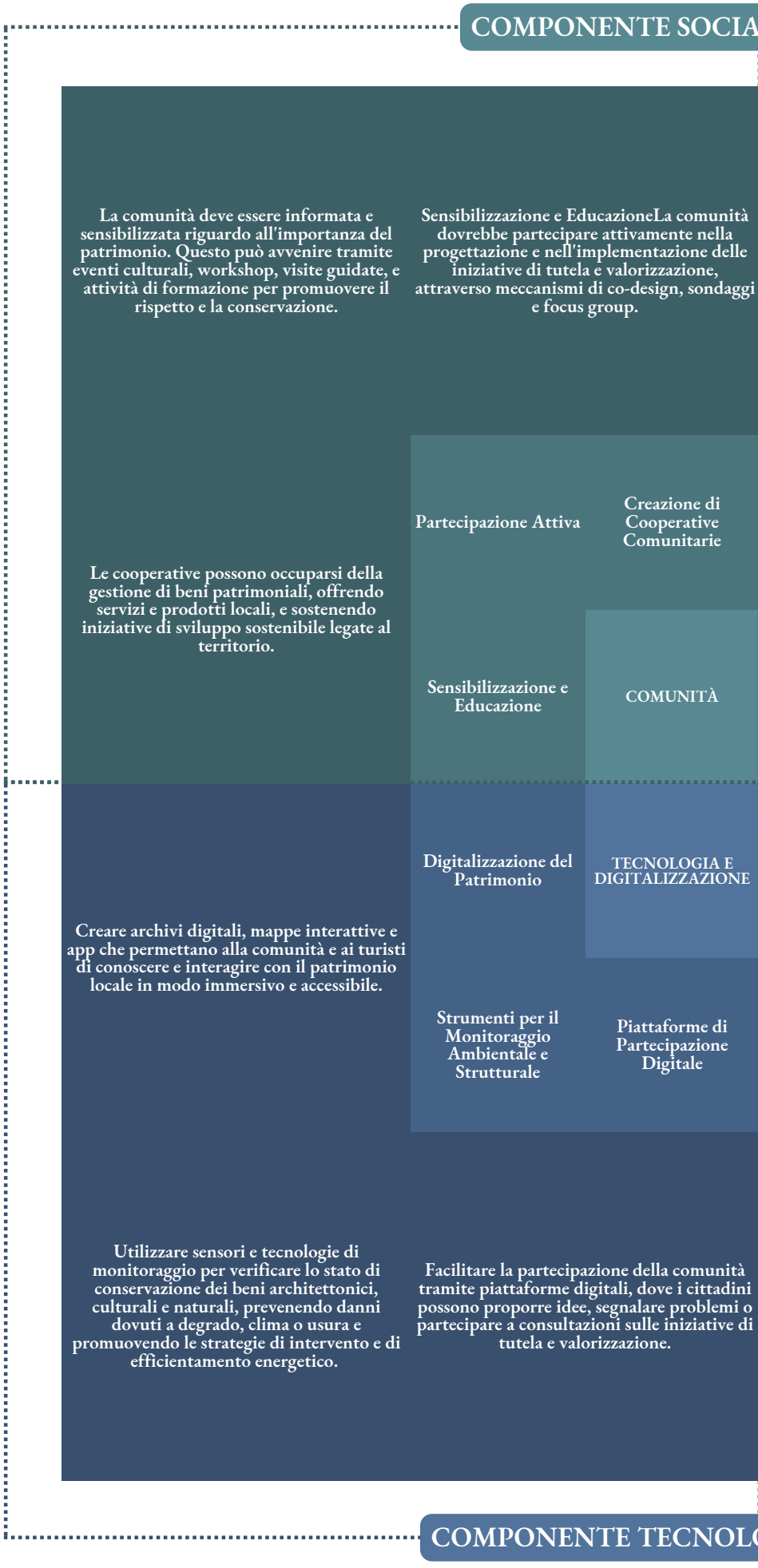


Fig. III.1.2 | Attori, tematiche e indicatori operatici degli Smart Villages ©Luisa Lombardo, 2024

LE E PARTECIPATIVA

Le cooperative possono occuparsi della gestione di beni patrimoniali, offrendo servizi e prodotti locali, e sostenendo iniziative di sviluppo sostenibile legate al territorio.

Creare partenariati con attori locali e aziende per promuovere progetti di valorizzazione del patrimonio, coinvolgendo risorse e competenze esterne per una gestione sostenibile e innovativa.

Elaborazione di Politiche di Tutela

Collaborazione Pubblico-Privato

GOVERNANCE

Monitoraggio e Valutazione

La governance deve monitorare l'efficacia delle azioni intraprese per la tutela del patrimonio, valutandone l'impatto e apportando migliorie costanti.

RECUPERO DEL PATRIMONIO MATERIALE E IMMATERIALE

Recupero, Restauro e Manutenzione

Attuare interventi di recupero, restauro per i beni architettonici materiali, rispettando le tecniche tradizionali e i materiali locali, assicurandosi che gli interventi siano sostenibili e rispettosi del valore storico.

Promozione di Eventi e Percorsi Culturali

Valorizzazione delle Tradizioni e delle Competenze Locali

Creare percorsi culturali e eventi tematici che possano attrarre sia la comunità locale sia visitatori esterni, facendo del patrimonio un punto di riferimento e di attrazione turistica sostenibile.

Promuovere la trasmissione delle conoscenze e delle pratiche locali attraverso scuole, laboratori e manifestazioni culturali, per mantenere vive le tradizioni e le arti locali.

OGICA E PATRIMONIALE

III.1.1 Comunità Smart

La comunità rappresenta il cuore di uno *Smart Village*, dove la partecipazione attiva diventa essenziale per orientare le decisioni in linea con le esigenze locali. In questo contesto, è cruciale educare sia la comunità coinvolta sia quella ancora da coinvolgere, intesa come un sistema integrato di residenti, turisti e nuovi abitanti, verso valori condivisi[1]. Questa educazione promuove la creazione di progettualità condivise, garantendo la permanenza delle generazioni, sia nuove che vecchie, nei territori rurali, un processo che contribuisce alla "restanza"[2].

E' opportuno, tuttavia, valutare come oggi il concetto di comunità sia cambiato, non bisogna pensare, infatti, ad una comunita stanziata, ma a una comunità diversificata come residenti, turisti e anche possibili nuovi residenti, ivi inclusi i migranti che potrebbero recare grandi opportunità per il territorio.

Strumenti di democrazia partecipata generano idee, progetti e turismo indotto e sostengono una gestione economica finalizzata al ripopolamento e alla rivitalizzazione dei territori, non solo per attrarre turisti (Scheyvens, 2002), ma anche per incentivare il ritorno alle origini. La partecipazione locale, infatti, rafforza l'identità territoriale, rendendo più solide le politiche locali. Coinvolgere la comunità in consultazioni pubbliche, co-progettazione e gestione condivisa dei servizi garantisce una *governance* inclusiva e una pianificazione che risponde alle esigenze locali (Nyaupane et al., 2006). Questi processi di democrazia partecipata portano benefici economici attraverso modelli di gestione orientati al benessere della comunità e alla valorizzazione del patrimonio culturale (Garcia et al., 2018).

Strumenti partecipativi offrono una modalità efficace per coinvolgere la popolazione nella pianificazione e gestione delle risorse locali e dei progetti da avviare nel territorio. Alcuni esempi concreti elaborati durante il percorso di dottorato, nel caso studio di Polizzi Generosa riguardano la partecipazione al sistema di democrazia partecipata e alla proposizione di soluzioni per il comune come l'implementazione di pareti verdi (*Fig. 2*) o l'illuminazione dei caratteristici "tocchi" polizzani che hanno garantito non sono una proposizione di soluzioni *green* o tecnologiche applicate al patrimonio costruito, ma sono state anche da monito per rendere la popolazione consapevole e edotta di quello che è possibile fare nel patrimonio architettonico locale, per recuperarlo e valorizzarlo (*Fig. 3*). Tali processi permettono ai cittadini di esprimere le proprie preferenze e di contribuire attivamente alla definizione delle priorità per lo sviluppo del territorio, ma anche di creare coscienza e informazione, come è avvenuto con le Officine Sperimentali[3], un esempio già sviluppato nei tempi della SNAI seppur non particolarmente diffuso come pratica virtuosa da attuare.

In Italia, diverse comunità hanno adottato questa impostazione, mirando a promuovere processi di sviluppo locale flessibili e capaci di innescare una dinamica di crescita più che di attuare singoli progetti . Il modello di *smart community* si a visione olistica di sviluppo territoriale che integra patrimonio culturale, architettonico e ambientale con innovazione digitale e tecnologica (Goodwin et al., 2009). Questo contesto partecipativo consente agli abitanti di prendere parte alle decisioni riguardanti l'ambiente e i progetti in corso, da sviluppare o già realizzati. Grazie a strumenti come sondaggi e assemblee pubbliche, le amministrazioni possono ascoltare e rispondere in modo mirato ai bisogni espressi dalla comunità, agevolando un approccio partecipativo e non *top-down* (Tricarico & Geissler, 2021). Tale metodo è particolarmente rilevante nelle aree interne, dove il fenomeno dell'invecchiamento della popolazione e l'isolamento geografico pongono sfide significative alla sostenibilità dei servizi e delle infrastrutture, richiedendo che la progettualità sia realmente accessibile ai cittadini e non imposta dall'alto (Camagni & Capello, 2017). Strumenti partecipativi adottati ad Amsterdam e Barcellona includono, oggi, i cittadini nelle scelte strategiche dell'amministrazione; membri della Cities Coalition for Digital Rights insieme a Milano. Iniziativa lanciata dalla città di new York nel 2016 volta a

[1] Si veda a titolo esemplificativo il rapporto The Role of Culture in Non-Urban Areas of the aEuropean Union, esito del progetto "Voices of Culture" organizzato dal Goethe-Institut su commissione delle istituzioni europee, sul ruolo della cultura nelle aree non urbane dell'Ue. Il progetto è parte integrante del "Dialogo strutturato con la società civile" previsto dagli accordi europei sul tema della cultura, che punta a coinvolgere le esperienze di campo nella definizione di politiche europee più vicine ai cittadini, alle esigenze reali degli operatori e delle istituzioni culturali. Il rapporto che è stato presentato a fine aprile 2020, è una tappa di questo percorso, che prevede una selezione di candidati su temi specifici, in questo caso la cultura nelle aree non urbane, il loro coinvolgimento in sessioni di riflessione congiunta, la produzione di un report contenente delle raccomandazioni e delle indicazioni di policy, il confronto a Bruxelles con i decisori, ossia i tecnici e i politici che mettono a punto le politiche di sostegno al sistema culturale. Testo disponibile all'indirizzo https://ec.europa.eu/assets/eac/culture/docs/voices-of-culture/voices-of-culture-brainstorming-report-green-transition-2023_en.pdf

[2] *Mi sono trovato, quasi per caso, come capita nella magica imprevedibilità della scrittura, ad adoperare, a inventare almeno in una nuova accezione, la parola "restanza". L'ho fatto in continuità e per assonanza con termini come erranza e lontananza. Perché restanza denota non un pigro e inconsapevole stare fermi, un attendere muti e rassegnati. Indica, al contrario, un movimento, una tensione, un'attenzione. Richiede pienezza di essere, persuasione, scelta, passione. Un sentirsi in viaggio camminando, una ricerca continua del proprio luogo, sempre in atteggiamento di attesa: sempre pronti allo spaesamento, disponibili al cambiamento e alla condivisione dei luoghi che ci sono affidati. Un avvertirsi in esilio e straniero nel luogo in cui si vive e che diventa il sito dove compiere, con gli altri, con i rimasti, con chi torna, con chi arriva piccole utopie quotidiane di cambiamento. Restare è legato all'esperienza dolorosa e autentica dell'essere sempre fuori luogo, proprio nel posto in cui si è nati e si abita o a cui se sente di appartenere. Non esiste, forse, spaesamento, sradicamento più radicale di chi vive esiliato in patria e combatte una lotta quotidiana, fatta di piccoli gesti per salvaguardare e proteggere i luoghi che potrebbero essere loro sottratti non da chi arriva da fuori, ma da chi vi abita dentro come un'anima morta. Il villaggio e la comunità da raggiungere non stanno indietro nel tempo, ma vanno raggiunti qui e ora, costruiti giorno per giorno. Anche con scarti, schegge, frammenti – nei margini, nelle periferie – del passato (riconosciuto e risarcito) in un luogo così vicino e così lontano. Restare significa raccogliere i cocci, ricomporli, ricostruire con materiali antichi, tornare sui propri passi per ritrovare la strada, vedere quanto è ancora vivo quello che abbiamo creduto morto e quanto sia essenziale quello che è stato scartato dalla modernità. E ancora volontà di guardare dentro e fuori di sé, per scorgere le bellezze, ma anche le ombre, il buio, le devastazioni, le rovine e le macerie. Non sono concessi autocompiacimento, autoe-*

saltazione ma neppure afflizione.
Restanza comporta riscoprire la bellezza della sosta, della lentezza, del silenzio, di un complesso e faticoso raccoglimento, stare insieme. Non è una considerazione all'insegna del «come era bello una volta» o di una sorta di «idealismo utopistico del passato», o un tentativo di proiettare nel passato l'ideale che non è vissuto nel presente, o di rimpianto di un «buon tempo andato», mitizzato e mai esistito nelle forme di tanti inventori di paradisi perduti. Le tradizionali forme di conflitto, lacerazioni, divisioni delle comunità sono scomparse o si sono trasformate in «narrazioni» per lasciare posto a nuove forme di conflitto o magari di coesione. Il ritorno-non ritorno deve, dunque, realizzarsi a partire da un'analisi approfondita di quello che resta, con la consapevolezza che gli antichi legami evocati e oggetto di rimpianto, le relazioni primarie e di solidarietà, vere o immaginate, sono profondamente mutati o non esistono più. È la presa d'atto che se una nuova comunità è possibile e auspicabile là dove esisteva l'antico paese, questa comunità comunque deve essere riorganizzata e inventata tenendo conto di fughe, abbandoni, ritorni e anche di mutate forme di produzione e rapporti sociali. Restare comporta creare nuove modalità dell'incontro, della convivialità, dell'esserci. Se è una scelta consapevole ed etica, restare non può diventare mai chiusura o territorio per artificiosi contrasti tra chi è partito e rimasto, tra chi è rimasto e chi oggi arriva o torna.
Coloro che restano potenziano il senso del viaggiare, e diventano approdo per quanti ritornano: forse perché viaggiare e restare, viaggiare e tornare, sono pratiche inseparabili, trovano senso l'una nell'altra. Rimasti e partiti debbono dare vita a una dialettica che parla di integrazione, d'incontro, di vite separate e di riconciliazione. Se è vero che anche chi resta in qualche modo si sente in viaggio, è anche vero che chi è partito in qualche modo si sente rimasto. Rimasti e partiti, senza enfasi e senza rancori, senza quel miscuglio di odio e amore, dovrebbero percepirsi nelle loro somiglianze e nelle loro diversità, legate a una particolare esperienza di vita, a un singolare rapporto con il luogo d'origine e con gli altri luoghi.
Restare, allora, non è uno slogan né un proclama. Si può affermare un'utopia delle piccole cose che richiede pazienza e cura, circospezione e tenacia, attenzione e apertura, senso di responsabilità e discorsi di verità che non ammettono illusioni. Presuppone sapere individuare dove soffia lo spirito del Carnevale, del rovesciamento, dell'utopia per fuggire dai luoghi di nuove fame e di inedite paure: cercare una città, come sognavano e , che deve riconoscere, rendere vero e abitabile il proprio interno per dialogare con il mondo e aprirsi a esso. Il paese presepe è finito, frantumato, smembrato, esploso, svuotato. Le sue schegge hanno costruito nuovi abitati, nuovi mondi. Molte di queste schegge tornano, profondamente mutate, all'indietro, alla ricerca del corpo perduto, che non troveranno, alla ricerca di un'impossibile riconciliazione e ricomposizione. Ma ogni ritorno è un nuovo inizio.
(Il senso della restanza, Vito Teti, 2017)

[3] Le Officine sperimentali delle aree interne non sono state solo spazi di discussione e di

promuovere e monitorare i diritti dei cittadini.

All'interno di questa visione, i cittadini, possono diventare *makers* e/o *k-makers* (fautori del sapere) assumono un ruolo chiave nel processo di trasformazione. I *makers* contribuiscono con la loro creatività alla realizzazione di soluzioni innovative attraverso pratiche di *co-design*. In questo modo, il territorio beneficia di una comunità attiva che partecipa alla co-progettazione e implementazione di soluzioni, rendendo le politiche locali più efficaci, rappresentative e allineate con le necessità del territorio. Allo stesso modo lo stesso cittadino è incoraggiato ad individuare le opportunità locali e a comprendere possibili passi da compiere in autonomia per crearsi nuove opportunità e, allo stesso tempo, creare nuove opportunità per il territorio. Il coinvolgimento dei cittadini nelle fasi di progettazione e attuazione delle politiche facilita un allineamento tra le aspettative della comunità e gli obiettivi di sviluppo sostenibile, contribuendo a una *governance* inclusiva e trasparente (Buhalis, 2015).

Le Cooperative di comunità e le comunità energetiche, ad esempio, rappresentano strumenti essenziali per favorire l'inclusione sociale e il rafforzamento del capitale sociale. Le cooperative di comunità, spesso costituite negli ultimi anni, non solo incentivano l'economia locale, ma favoriscono il senso di appartenenza e inclusione, mobilitando risorse economiche e competenze per progetti a beneficio collettivo. Queste cooperative, radicate nel contesto locale, supportano lo sviluppo di servizi turistici, culturali e ambientali, in linea con la vocazione territoriale e le tradizioni locali, rafforzando il legame tra economia e partecipazione attiva. Verbumcaudo a Polizzi generosa è un virtuoso esempio di resilienza e opportunità del comparto delle Madonie, da luogo sottratto alla mafia a luogo di produzione e di attività per il territorio. Rappresentano un modello di impresa dal basso, dove i cittadini partecipano alla gestione di attività economiche orientate alla tutela e valorizzazione del patrimonio locale, promuovendo una gestione collettiva di risorse e servizi, con una prospettiva di lungo termine che coniuga sostenibilità economica e responsabilità sociale (Borzaga, 2019).

Le comunità energetiche, infine, promuovono l'autosufficienza energetica sfruttando le risorse locali per la produzione di energia pulita (Lombardo, 2022). Questo tipo di progettualità non solo riduce l'impatto ambientale, ma crea nuove opportunità economiche per i residenti, permettendo alla comunità di beneficiare direttamente delle risorse del territorio e contribuendo allo sviluppo sostenibile (Kumari et al., 2022); diventano, dunque, produttori e ultilizzatori. L'integrazione efficace di queste strategie nelle politiche pubbliche dimostra come la partecipazione comunitaria possa sostenere progetti ad alto impatto sociale, energetico, produttivo ed economico, garantendo un miglioramento della qualità della vita e un'adeguata protezione del patrimonio locale, così come evidenziato nelle tante opportunità offerte dall'Atlante (Lombardo, 2023).

In Sicilia, il progetto Europeo SIAS2[4], la *Summer School* nelle aree interne madonite di Isnello, Polizzi Generosa e Petralia Sottana, ha coinvolto popolazione e giovani in pratiche di *co-design* e approccio partecipativo, rispondendo non solo alle esigenze amministrative, ma anche a quelle locali. Questo progetto ha dimostrato come la partecipazione comunitaria possa ispirare iniziative e progetti a misura della comunità, tra cui imprese sociali che creano opportunità di lavoro, servizi sociali e culturali accessibili, e partecipazione civica nella pianificazione territoriale; *hub* creativi e formativi, artigianato e produzione locale.

Cooperative agricole e comunità locali, inoltre, emergono come soluzioni per la sostenibilità agricola, sociale ed economica e la produzione alimentare locale, mediante condivisione di risorse e vendita diretta dei prodotti slow-food che sono, nella maggior parte dei casi, proprio prodotti dai *locals* con pratiche tradizionali. Gli *hub* di innovazione e le fabbriche sociali rappresentano spazi di collaborazione per lo sviluppo di nuove idee e per il potenziamento dell'economia locale, senza pensare a strutture create ad hoc, ma considerando la messa a sistema di risorse territoriali a supporto delle

possibili attività da avviare. Progetti di turismo sostenibile come agriturismi e percorsi escursionistici, turismo esperenziale e lento, valorizzano le risorse naturali e culturali, portando benefici economici alle comunità rurali. Programmi di formazione e sviluppo delle competenze sono essenziali per trattenere i residenti nelle comunità e contribuire al loro sviluppo.

Avviare processi di progettazione senza il coinvolgimento attivo della comunità nei meccanismi gestionali, amministrativi e decisionali rischia di privare il progetto di senso per gli abitanti, i quali non si sentirebbero parte integrante dell'iniziativa. Questo potrebbe generare la percezione di un progetto estraneo e imposto dall'esterno, piuttosto che nato dalla condivisione e dall'impegno comune per il loro futuro.

Nei paragrafi successivi saranno analizzate la metodologia e le strategie suggerite alle comunità locali oggetto di studio al fine di creare un primo terreno per lo sviluppo e il raggiungimento di uno Smart Village a partire da un'esperienza concreta.

L'imprenditorialità sociale, se affrontata in maniera consapevole e con il presupposto della condivisione non solo delle strategie, ma intesa come un processo che aiuta la comunità e in primis la possibilità di lavoro nelle piccole aree interne, rappresenta una delle leve più potenti per stimolare la partecipazione locale e promuovere il cambiamento nelle aree rurali italiane ed europee. Si tratta di promuovere impegno verso il benessere sociale e la risoluzione di problemi comunitari, ponendosi come alternativa alla mera ricerca di profitto. Le iniziative di questo tipo contribuiscono alla creazione di valore sociale, culturale e ambientale, migliorando sensibilmente la qualità della vita nelle comunità locali. Le imprese sociali, spesso gestite da cooperative, associazioni o fondazioni, giocano un ruolo cruciale nello sviluppo locale attraverso attività che spaziano dalla produzione di beni e servizi alla gestione di spazi comuni e alla promozione di progetti culturali e sociali[5]. Queste organizzazioni non solo generano occupazione, ma rafforzano anche la coesione sociale e favoriscono la partecipazione attiva dei cittadini, che diventano veri e propri organizzatori della comunità operatività, radicata nel territorio, si basa sulla capacità di rispondere alle esigenze locali attraverso modelli di business sostenibili e inclusivi.

Due esempi concreti illustrano questi principi: il primo riguarda la masseria Verbumcaudo nelle Madonie, acquisita dalla Regione Siciliana e gestita dalla cooperativa sociale Verbumcaudo, in fase di riqualificazione grazie ai fondi del PNRR per la creazione di spazi multimediali, laboratori per scuole e giovani, e riqualificazione energetica, con un investimento di 5,3 milioni di euro. Il secondo caso è il Borgo di Canistro, finanziato dal PNRR con 1,6 milioni di euro per il progetto "Dimensione CRESCITA", che prevede il recupero di una chiesa sconsacrata come Polo Culturale, un immobile come Infopoint e centro di educazione ambientale, e la creazione di un *InnovationHub* per l'ambiente. L'adozione di tecnologie moderne come Li-Fi e totem touchless valorizza il patrimonio locale, sostenendo il turismo lento e sostenibile. Questi esempi dimostrano come l'innovazione sociale e la partecipazione locale, in seno alle imprese sociali, possano contribuire significativamente alla valorizzazione e alla rivitalizzazione dei territori. È essenziale che tali iniziative rispondano alle risorse locali e coinvolgano attivamente la comunità nel processo decisionale. La collaborazione tra comunità diverse e la condivisione di risorse e conoscenze rappresentano un valido contributo alla crescita e al benessere delle aree interne, promuovendo un senso di appartenenza e cooperazione reciproca.

confronto, ma hanno visto il coinvolgimento di associazioni, operatori economici e dei servizi, amministrazioni locali e ricercatori che operano nelle aree interne al fine di definire, insieme, un numero contenuto e per quanto possibile preciso di policy da sottoporre ai decision makers in tempi utili per essere prese in considerazione nella nuova fase programmatoria. Tra i percorsi intrapresi si menziona la figura professionale dell'attivatore di comunità a cui è stato il compito arduo di mappare e riassegnare le terre abbandonate e agevolare l'accesso ai beni immobili per favorire la rigenerazione territoriale, dei luoghi, fare formazione sul patrimonio ambientale e locale, promuovere le comunità energetiche, creare iniziative per l'accompagnamento e la formazione per lo sviluppo di idee, imprenditoria, innovazioni, competenze e professioni. E ancora, favorire servizi di prossimità, promuovere la cultura della partecipazione e assicurare momenti e spazi per il dialogo sociale e con la Pa.

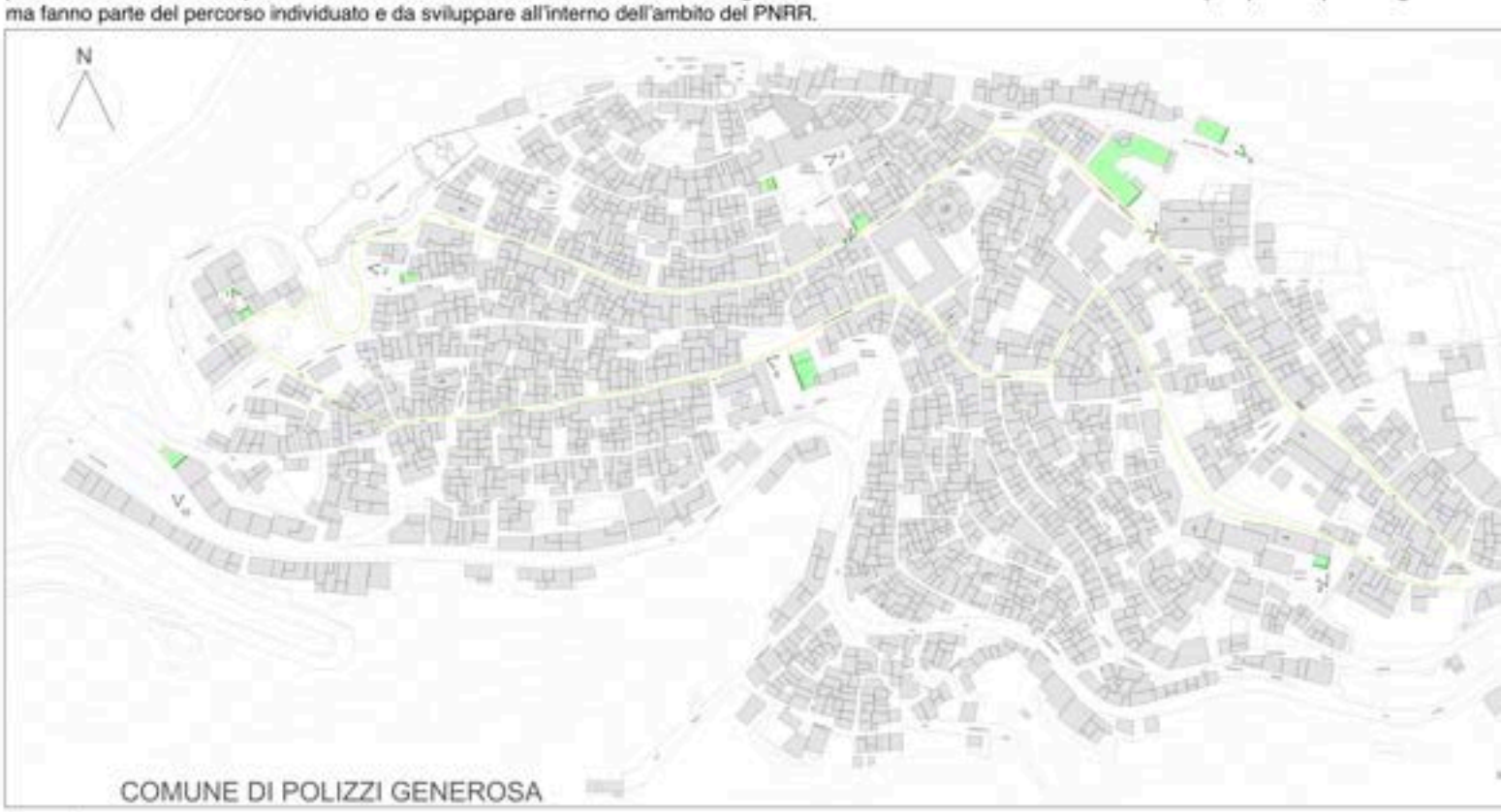
[4] Sicilian Inner Areas Summer School - N 2024-1-IT03-ESC30-SOL-000228603. Finanziato da Agenzia Italiana per la Gioventù & Europa Corpo di Solidarietà. Progetto di GiN APS (Giovani IN APS) [vedasi sottocapitolo successivo]

[5] Basti pensare al "Bando montagna" della Regione Emilia Romagna attraverso il quale circa 700 giovani famiglie negli ultimi anni si sono trasferite nei comuni appenninici beneficiando di contributi regionali a fondo perduto per l'acquisto e la ristrutturazione della casa e usufruendo gratuitamente di servizi per avviare o consolidare il proprio percorso professionale in loco. Anche la città metropolitana di Torino sta puntando sulla "domanda di montagna" per avviare processi di sviluppo locale. Recentemente è stato avviato uno sportello di consulenza gratuita attraverso il quale è possibile accedere a progetti di mentorship e networking per costruire percorsi di inserimento socio-lavorativo nelle aree interne e montane. Ispirata al progetto "InnovaAree" promosso dal Collegio Carlo Alberto, Uncem, SocialFare e finanziato da Fondazione Compagnia di San Paolo. Per due anni, fino al 2019 il progetto ha supportato le idee imprenditoriali di sessanta innovatori sociali e il desiderio di centro persone intenzionate a cambiare vita e trasferirsi nelle aree interne e montane piemontesi. Anche il programma regionale in Puglia "Bollenti Spiriti" ha puntato sull'attivazione dei giovani e sul sostegno ai loro progetti di vita e di lavoro per generare un cambiamento delle condizioni di contesto attraverso l'accesso a risorse economiche a bassa soglia e a formazione specialistica degli stessi giovani.

Fig. III.1.1.1 | La comunità polizzana apre i monumenti ai visitatori ©Michele Tumminello, 2021

Benefici della parete verde, applicazione e rinverdimento:

Le pareti verdi, o giardini verticali, si delineano come elementi che manifestano un impatto positivo sul microclima interno degli edifici. Le specie vegetali svolgon fluttuazioni termiche, contribuendo all'isolamento termico mediante la creazione di un cuscino d'aria, rinfrescando l'atmosfera attraverso il processo di evap dell'irraggiamento solare e del vento, e garantendo isolamento acustico. I giardini verticali contribuiscono, inoltre, a mitigare le temperature nell'ambiente urbano, tipologia di giardini verticali che adotta l'inverdimento indiretto è ancorata alla facciata dell'edificio attraverso un'apposita struttura di supporto. Per un ottimale esposizi è sud-est, poiché a sud o a sud-ovest si ha una diretta e lunga esposizione ai raggi solari, con conseguente inaridimento del terreno. Un'esposizione a nord o nord-e di resistere anche in assenza parziale di sole. Gli interventi proposti mirano non solo al miglioramento del comfort indoor e outdoor, ma contribuiscono al migliorame o di edifici che fungono da "porte" di accesso al paese, il più delle volte costituiti da pareti cieche o semicieche. La scelta di questo intervento non è casuale, cons pensili, che evoca un luogo da sempre in stretto contatto con la natura. Essa funge da elemento per migliorare il decoro urbano e rendere più piacevoli i luoghi di in parte integrante di un processo di recupero e valorizzazione ambientale. Questo intervento è coerente con il percorso del PNRR "G.A. BORGESE GENIUS LOC preservare e valorizzare il patrimonio naturale e architettonico, contribuendo al miglioramento del tessuto urbano e alla creazione di spazi pubblici più accoglienti e sos ma fanno parte del percorso individuato e da sviluppare all'interno dell'ambito del PNRR.



Legenda:

- edifici interessati dal progetto di giardino verticale
- prospetti interessati dal progetto
- perco
- coni ottici di inquadramento di intervento
- 1< cortile Santo Spirito prospiciente casa G.A.Borgese orientamento nord-ovest
- 2< Piazza SS. Trinità prospiciente belvedere orientamento ovest
- 3< Piazza Barone Carpinello orientamento nord-est
- 4< Salita Carpinello prospiciente Via Garibaldi orientamento sud-ovest
- 5< Via Roma prospiciente Chiesa Madre orientamento sud-est
- 6< Via Giovanni Borgese prospiciente belvedere orientamento sud-est
- 7< Via Madonna delle Grazie prospiciente entrata est del paese orientamento nord-est
- 8< Piazza orienta
- 9< Piazza orienta
- 10< Via San orienta

o un ruolo fondamentale nell'attenuare le
otraspirazione, proteggendo dagli effetti
contrastando l'effetto "isola di calore". La
one alla luce solare, l'orientamento ideale
st, è possibile scegliendo piante in grado
nto del decoro urbano di luoghi di incontro
iderando la storia di Polizzi e dei giardini
contro e di aggregazione. Il suo utilizzo è
I", il quale promuove azioni finalizzate a
tenibili. Gli edifici scelti, non sono casuali,

rso PNRR

Turati , sagrestia Chiesa Santa Margherita
mento sud-ovest e nord-est

G.B.Caruso, Palazzo Postale
mento sud-ovest

nto Gagliardotto prospiciente entra ovest del paese
mento sud-est

Specie vegetali consigliate:

Solanum jasminoi
pianta rampicante sempreverde, dalla generosa fioritura di fiori bianchi a forma di stellades

Jasminum nudiflorum
pianta rampicante sempreverde, dalla generosa fioritura di fiori gialli

Clematis Montana Hybrida "Rubens"
pianta rampicante sempreverde, dalla generosa fioritura di fiori rosa

Muschio
pianta da inserire nel caso di pareti parzialmente rivolte a Nord

Caprifoglio
pianta rampicante resistente ai climi freddi

Dettaglio costruttivo

Sistema di fissaggio per rampicanti, mediante l'uso di reti elettrosaldate e geogriglie

Sistema di fissaggio modulare

Valutazione tecnico - economica

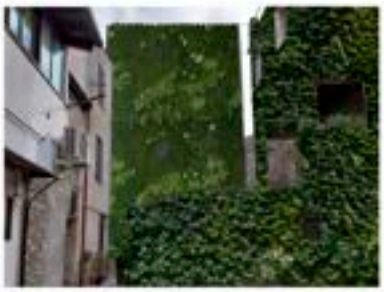
Costo: 200 €/ m2

Piante: autoctone sempreverdi, rampicanti o muschi

Sistema di irrigazione: a goccia

Sistema di fissaggio: mediante reti elettrosaldate per rampicanti o mediante moduli per piantumazioni a vaso reperibili in loco. Poichè la crescita verticale delle piante richiede un sostegno adeguato, vengono spaziano dall'uso di cavi tesi a grigliati, da facciate a doppia pelle a file di fioriere installate direttamente sulla parete. In ogni caso, indipendentemente dal sistema adottato, è essenziale mantenere una distanza tra la vegetazione e l'involucro edilizio per preservarlo da eventuali danneggiamenti causati dalle radici e dai germogli delle piante. Si predilige, tuttavia il sistema a cavi tesi grigliati o a facciate a doppia pelle.

Manutenzione: autonoma tramite irrigazione. La struttura movibile, facilmente smontabile e manutenibile, può essere costituita sia da piante naturali che da piante artificiali



Legenda:

- tocchi storici interessati dal progetto
- percorso PNRR

1. tocco di Cortile Santo Spirito
2. tocco sud di vicolo Notaro
3. tocco nord di vicolo Notaro
4. tocco di Vicolo Battiato
5. tocco di vicolo Glorioso
6. tocco di vicolo Donna Violanta
7. tocco di vicolo Riccobene
8. tocco di Vicolo Signorino
9. Chiasso Fatta
10. tocco di Vicolo Moschea
11. Chiasso di fronte Vicolo Caracciolo

DESCRIZIONE DEL PROGETTO

La Proposta di progetto tende a valorizzare i vari tocchi o chiassi
al led che ne valorizzi i passaggi e ne migliori non solo la visibilià
luoghi totalmente bui. Tali passaggi sono manifestazione dell'ant
urbanistici di stile ebraico, arabo o ancora importanti direttrici di
Il progetto vuole essere parte integrante di un processo di recup
il percorso del PNRR "G.A.BORGESE GENIUS LOCI", il quale promu
architettonico, contribuendo al miglioramento del tessuto urban

Il Progetto prevede l'intervento su undici luoghi del centro storic
quota della pavimentazione e su un unico lato per ogni Tocco.
E' previsto un costo di € 300 per ciascun Tocco.

FOTO DEI LUOGHI DI INTERVENTO PREVISTI

1 tocco di Cortile Santo Spirito

2 tocco sud di Vicolo Notaro

3 tocco nord di Vicolo Notaro, entrata inferiore

3 tocco nord di Vicol

5 tocco di Vicolo Glorioso

6 tocco di vicolo Donna Violanta

7 tocco di Vicolo Riccobene, entrata superiore

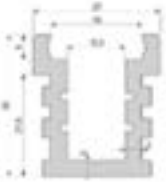
7 tocco di Vicolo Ricc

storici del Comune di Polizzi Generosa tramite un instalazzione di illuminazione
notturna ma anche la fruibilità degli stessi, essendo alcuni , allo stato attuale,
ica origine di Polizzi essendo nella maggior parte testimonianze di tessuti
collegamento verso manufatti storici di pregio.
ero e valorizzazione architettonica e culturale. Questo intervento è coerente con
ove azioni finalizzate a preservare e valorizzare il patrimonio naturale, culturale e
o e alla creazione di spazi pubblici più accoglienti.

o apponendo una striscia al Led ,incassata su un profilo metallico, posta sulla

ALCUNI PARTICOLARI COSTRUTTIVI

l'illuminazione tramite led verrà allocata in profili di alluminio.
Strisce flessibili e rigide fino a 12,3 mm di larghezza, Di facile installazione, il prodotto può essere facilmente tagliato in autonomia. Garantisce inoltre una protezione efficace delle strisce LED da fattori esterni e permette una loro maggiore durata grazie ad un sistema interno di raffreddamento passivo. Versione in alluminio naturale, lunghezza 2 m.



RIFERIMENTI PROGETTUALI

Varie vedute del Chiasso di Sant'Ansano di Santa Maria della Scala, Siena.

o Notaro, entrata superiore

4 tocco di Vicolo Battiato

9 Chiasso Fatta, primo tocco

9 Chiasso Fatta, parte interna del primo tocco

obene, entrata inferiore

8 tocco di Vicolo Riccobene, entrata inferiore

9 Chiasso Fatta, uscita del secondo tocco

10 tocco di Vicolo Moschea

III.1.1.1 SIAS2 - Sicilian Inner Areas Summer School

Nel terzo anno di dottorato, grazie alla partecipazione ai progetti europei del Corpo Europeo di Solidarietà, in collaborazione con l'Agenzia Nazionale per i Giovani, è stata promossa una *Summer School* dedicata alle Aree Interne. Il progetto, intitolato *Sicilian Inner Areas Summer School* (acronimo SIAS2), progetto N.2024-1-IT03-ESC30-SOL-000228603, è stato finanziato dall'Agenzia Italiana per la Gioventù e dal Corpo Europeo di Solidarietà, sotto l'egida di GiN APS (Giovani IN APS).

Attualmente, i piccoli comuni delle aree interne siciliane soffrono di una carenza di professionalità adeguate, di tecnici disponibili e di idee innovative da sviluppare (Sagyndykova, 2021). Il confronto diretto con le problematiche del territorio, coinvolgendo le amministrazioni locali e, soprattutto, i cittadini, ha consentito di condurre un'analisi concreta dei bisogni e di comprendere i potenziali risultati da conseguire, nonché elaborare proposte e progetti per i territori in esame.

L'obiettivo principale del progetto è stato, non solo portare un progetto del Corpo Solidale Europeo vicino alle nostre esperienze di ricerca sulle aree interne, ma soprattutto promuovere il recupero, la tutela e la valorizzazione delle aree interne siciliane, con particolare attenzione ai territori delle Madonie e dei Sicani, estendendo lo sguardo anche al Calatino, un'altra area interna situata nella Sicilia orientale promuovendo la democrazia partecipata. L'obiettivo secondario era anche quello di far dialogare tra loro piccole aree siciliane territorialmente distanti. Condividere risultati, affinchè possano circolare idee e progetti replicabili. La *Summer School* è stata concepita come uno strumento pratico per implementare il concetto di *Smart Villages*, un'idea centrale della ricerca che ha trovato le sue prime applicazioni nell'Atlante elaborato come output del progetto e nelle Linee Guida per il Comune di Polizzi Generosa.

Le strategie di *co-design* (Lepore, 2023) adottate hanno visto la partecipazione attiva di studenti, ricercatori, dottorandi, nonché della comunità locale, delle associazioni e delle amministrazioni nella disamina delle scelte progettuali da intraprendere (Ellis et al., 2009). Questi attori hanno collaborato per analizzare le problematiche esistenti nel territorio, trasformandole in opportunità concrete e soluzioni trasferibili. Partendo dall'analisi dei bisogni espliciti delle amministrazioni locali, una serie di interviste, nonché inviti a partecipare ai processi di progettazione sul campo, ha permesso di identificare anche i bisogni impliciti e latenti della popolazione. Gli attori principali — amministrazioni, cittadini, studenti e università — si sono confrontati per affrontare quattro tematiche prioritarie: Cultura e Tradizioni, Branding e Turismo, Accessibilità e Decoro Urbano, e Servizi (Phillips et al., 2007; Jitea et al., 2018). In particolare, per l'area, queste tematiche sono state prese in considerazione le soluzione dell'Altante per mettere a sistema il progetto europeo ela ricerca e i progeti in situ.

Come risultato di questa collaborazione, sono stati elaborati 16 progetti dai team per le amministrazioni e le comunità locali, rendendo i partecipanti e i residenti pienamente consapevoli di un futuro possibile, concreto e immediato per i loro territori (Dimitra et al., 2022). Questi progetti, oltre a rispondere alle specifiche esigenze del territorio, sono stati progettati per essere trasferibili e replicabili in altre realtà con metodi simili. Una volta compresa la vocazione territoriale, i progetti sono stati sottoposti a una valutazione tecnica e normativa per verificarne la compatibilità e la fattibilità rispetto al patrimonio locale, con l'obiettivo di sviluppare soluzioni replicabili in altri contesti. La *Summer School* ha dimostrato come il concetto di "*Smart*", inteso come intelligente e innovativo, possa coniugarsi con iniziative che promuovono la crescita integrata del territorio (Inzerillo et al., 2024). Tali attività hanno facilitato la creazione di reti collaborative tra attori diversi, volte a comprendere e analizzare il territorio, individuare i bisogni dei suoi abitanti e sviluppare progetti specifici e mirati. L'iniziativa ha avuto il precipuo obiettivo di promuovere un futuro sostenibile e resiliente per queste aree, a misura d'uomo e capace di rispondere alle sfide attuali nonché

ai bisogni dei cittadini.

Inoltre, per valorizzare il patrimonio costruito, per lo sviluppo della *Summer School*, sono state prese in considerazioni le risorse territoriali sin dalla sua organizzazione (Lee et al., 2021). Ad esempio, i luoghi scelti per la realizzazione, non sono stati altro che edifici messi a disposizione dai comuni, musei, conventi e scuole, intesi come *Hub* di Innovazioni, al fine di promuovere e valorizzare le risorse locali, ma al contempo rendere consapevoli i comuni delle possibilità presenti o anche delle mancanti.

La metodologia adottata ha previsto degli step specifici che riguardano lo sviluppo di maratone creative di design sprint (Knapp et al., 2022) ivi compresi sistemi e procedure di recupero e valorizzazione del patrimonio costruito e del patrimonio immateriale per sviluppare progetti in maniera rapida e con l'ausilio di trovarsi nei territori e dialogare con amministrazioni, ma soprattutto i residenti. Gli step effettuati, in particolare, sono stati i seguenti:

1. Kickoff: presentazione dell'amministrazione e degli stakeholder, e assegnazione della challenge

Il kickoff è l'evento inaugurale, durante il quale l'amministrazione locale e gli *stakeholder* coinvolti, come associazioni, cittadini e consulta giovanili, si presentano e introducono la sfida (challenge) che guiderà l'intero progetto. Questo momento è risultato cruciale per delineare gli obiettivi, definire il contesto operativo e assegnare la challenge agli *stakeholder* considerati e ai team di lavoro. L'obiettivo di questo step è chiarire progettualità, aspettative, risorse e potenziali vincoli, oltre a creare un ambiente collaborativo tra tutti i partecipanti.

2. Ice Break: attività di inizio diverse per ogni comune

L'ice break è un'attività iniziale mirata a creare un clima di collaborazione e fiducia tra i partecipanti dell'hackaton creativo. Questo momento è pensato per favorire l'interazione tra i membri del team, *stakeholder* e amministrazione, e varia da comune a comune, riflettendo le peculiarità del territorio e della cultura locale. Potrebbe assumere la forma di giochi di gruppo, conversazioni aperte o attività sociali, adattate per rompere il ghiaccio e stimolare la comunicazione e un engagement favorevole nei gruppi di lavoro.

3. Consultazione: sistematizzazione e raccolta dati del comune e della challenge

In questa fase, si procede con la sistematizzazione delle informazioni esistenti riguardanti il comune e la challenge assegnata. Oltre a raccogliere dati preesistenti, si svolge una nuova indagine sul campo per acquisire ulteriori informazioni che possano essere utili per affrontare la sfida. Questo processo permette di avere una visione chiara del contesto socio-culturale, economico e ambientale in cui si opera, nonché delle sfide specifiche che il progetto intende risolvere.

4. Interviste: sopralluogo e prime interviste agli stakeholder

Il team effettua poi diversi sopralluoghi nel comune per comprendere meglio il contesto fisico e sociale in cui sono immersi. Successivamente, si conducono interviste con *stakeholder* chiave, come rappresentanti dell'amministrazione locale, imprenditori, cittadini e altri soggetti influenti e coinvolti nel progetto e nella progettualità. Le risposte raccolte vengono mappate per identificare citazioni rilevanti e insight che potranno informare le successive fasi del progetto. Inoltre, viene somministrato un questionario ai cittadini per raccogliere dati quantitativi e qualitativi sulle opinioni e sulle esigenze della comunità locale.

5. *Proto personas* e *personas*: validazione e sviluppo

In questa fase, si verifica e convalida l'esistenza di proto-personas, ossia rappresentazioni iniziali di gruppi di utenti basate sui dati e sulle prime interviste. Se necessario, vengono sviluppate nuove personas, cioè rappresentazioni

dettagliate di utenti tipo che sintetizzano bisogni, comportamenti e motivazioni emersi durante le interviste. Queste personas aiuteranno il team a focalizzare il progetto sulle esigenze reali degli utenti finali.

6. Dalla challenge all'opportunity: trasformare il problema in opportunità di design
Ogni problema contiene in sé le potenziali soluzioni. In questa fase, si riflette su come le giuste domande possano portare a ottime risposte. Viene identificata una "*design opportunity*" attraverso l'analisi della challenge assegnata, cercando di individuare gli spunti che possano dare vita a soluzioni innovative.

7. Brainstorming di gruppo e rebrief
Questa fase consiste in un momento di dibattito aperto tra i membri del team, durante il quale si discutono i dati raccolti. Si sviluppa una *moodboard* di *insight* che riassume le idee emerse e si redige un nuovo *brief* (anche chiamato *rebrief*) che chiarisce la direzione da prendere in base alle nuove scoperte. Questo processo serve a focalizzare ulteriormente l'obiettivo progettuale, dando struttura alle idee per la fase successiva.

8. HMW (How Might We): sviluppo del quesito progettuale
Lo sviluppo del quesito progettuale si concentra sulla formulazione delle domande "*How Might We*" (è la fase del Come potremmo noi). Queste domande sistematizzano le intuizioni emerse e aiutano a identificare i punti critici del problema. Le HMW permettono di rivisitare positivamente i limiti del progetto, trasformandoli in opportunità di innovazione.

9. Sketch individuale: sviluppo creativo in 4 passi
La fase di *sketching* si articola in quattro step distinti, che stimolano la creatività individuale:
Notes [10 min.]: Ogni partecipante annota le problematiche principali.
Ideas [10 min.]: I partecipanti generano idee su carta, senza vincoli.
Crazy 8 [8 min.]: Sviluppo rapido di 8 idee in 8 minuti, per esplorare soluzioni diverse e aprire la mente su nuovi percorsi e prospettive.
Solution Idea [12 min.]: Creazione di uno *sketch* dettagliato della soluzione proposta, includendo un breve *storytelling* in grado di illustrare l'idea.

10. Decide and refine: selezione e perfezionamento dell'idea
Dopo la fase di sketching, il team vota le idee proposte di ciascun partecipante e seleziona quella/e con il maggiore potenziale ai fini del raggiungimento dei bisogni delle comunità e di tutti gli altri enti coinvolti nel processo progettuale. La proposta vincente viene ulteriormente sviluppata e raffinata, integrando eventuali *feedback* emersi durante la discussione. Viene infine elaborato un nuovo storytelling, definitivo e migliorato, che rappresenta in modo chiaro la soluzione progettuale scelta.

11. Pretotipo: sviluppo di pretotipi e simulazioni
Viene creato uno *sketch* unico del progetto e sviluppati dei pretotipi, che rappresentano versioni preliminari del progetto, prodotto o servizio da erogare. Questi pretotipi possono includere *storytelling*, fotomontaggi o simulazioni che aiutano a testare la funzionalità e la comprensione da parte degli utenti e servono per verificare la compatibilità della proposta progettuale.

12. Design Vision: definizione della visione del progetto
In questa fase, il team definisce la visione progettuale, includendo i principi di design irrinunciabili, i valori, e gli elementi di innovazione. Si considerano anche i punti di unicità e replicabilità del progetto, valutando la sua sostenibilità ambientale, economica e sociale.

13. Prototipo: creazione di prototipi rapidi

Ogni gruppo sviluppa un prototipo rapido e "usa e getta" utilizzando tecniche di prototipazione e role-playing per simulare l'uso del prodotto o servizio. Il prototipo serve a rendere tangibile l'idea progettuale e sarà utilizzato nella fase di test.

14. Test progetto: identificazione di forze e debolezze
Vengono sviluppati test per valutare i punti di forza e debolezza del progetto. Si raccolgono feedback da video, interviste e osservazioni dirette sull'uso del prototipo. Questo aiuta a comprendere le affordance e l'esperienza degli utenti.

15. Presentazione: outcome finali
Due risultati finali vengono realizzati:

- **Presentazione Guy Kawasaki (10 Slide):** Una presentazione sintetica e d'impatto dell'idea progettuale.
- **Video narrativo:** Un video di 30 secondi fino a 2 minuti che racconta il progetto. Si possono usare strumenti di AI, ma è richiesta la valorizzazione delle risorse visive locali.

L'approccio adottato durante la *Summer School*, che ha coinvolto i piccoli contesti delle aree interne, ha dimostrato come il metodo dello Sprint sia particolarmente efficace per rispondere a domande fondamentali che imprenditori e leader si pongono quotidianamente riguardo le proprie iniziative. Le maratone creative realizzate hanno dimostrato come la capacità di concentrare i propri sforzi su un aspetto cruciale e di affrontarlo in modo concreto è un elemento essenziale per trasformare le idee in realtà. Lo Sprint, infatti, permette di definire soluzioni rapide attraverso la creazione di prototipi e la validazione diretta con gli attori delle comunità, riducendo significativamente il tempo necessario per ottenere risposte certe. Questo processo, porta a risultati tangibili in vari settori ed è applicabile a team di qualsiasi dimensione, dalle municipalità, allo *startup,* alle grandi imprese, fino alle organizzazioni *no-profit*, il *Design Sprint* si è rivelato, così, un metodo prezioso dunque anche per le realtà delle aree interne, offrendo strumenti concreti per l'innovazione e la sperimentazione, con l'obiettivo di affrontare le sfide locali in tempi rapidi e con impatti misurabili.

Tuttavia, è importante sottolineare che questo rappresenta solo un primo approccio. Per elaborare progetti e proposte efficaci e sostenibili, è necessario intraprendere un processo di approfondimento progettuale, che includa ulteriori analisi e riflessioni. Solo attraverso questi passaggi sarà possibile giungere a soluzioni più mature, ottimizzate e avanzate, in grado di rispondere alle specificità e alle sfide uniche di ciascun contesto.

Fig. III.1.1.1.1 | UTC Plenary Session ©SIAS2, 2024

Fig. III.1.1.1.4 | Hackaton SIAS2 ©Luisa Lombardo e Samuele Morvillo, 2024

III.1.2 Governance Smart

La *governance* svolge un ruolo cruciale negli *Smart Villages* (Abdulai, 2020), complementando il ruolo fondamentale della comunità e integrando tecnologia, partecipazione e sostenibilità per rendere le politiche pubbliche più inclusive, trasparenti ed efficaci. In un'ottica *smart*, le amministrazioni devono essere in grado di cogliere le opportunità offerte dai bandi per attrarre fondi a favore dello sviluppo locale. Questo approccio non si limita alla progettualità, ma richiede l'integrazione della popolazione, fondamentale per una partecipazione attiva nei processi decisionali.

L'utilizzo di portali digitali è uno degli strumenti principali per favorire il coinvolgimento della comunità (Alsharif et al., 2010). Tali portali offrono ai cittadini la possibilità di esprimere opinioni, partecipare a sondaggi, restare informati sulle iniziative locali e contribuire attivamente alla progettazione di politiche pubbliche. In questo modo, la partecipazione non è più confinata a forme tradizionali di interazione, ma diventa continua e accessibile anche per chi risiede in aree remote. La digitalizzazione consente alle amministrazioni locali di raccogliere feedback in tempo reale, migliorando così la qualità delle decisioni e rendendo i processi più democratici e trasparenti.

Le piattaforme digitali assumono importanza non solo nella fase partecipativa, ma anche per la messa a sistema dei progetti, proposte e soluzioni volte a promuovere progettualità da avviare.

Un esempio illuminante di questo approccio si trova nelle iniziative di smart village in Spagna (Castellò, 2023), dove alcune amministrazioni delle regioni montane hanno promosso un equilibrio tra modernizzazione tecnologica e preservazione della cultura locale. Qui, la *governance* ha facilitato la digitalizzazione dei servizi pubblici e ha creato piattaforme digitali che mettono in contatto i cittadini con le istituzioni locali (Pazos-Vidal, 2022). L'approccio si concentra sulla consultazione e co-progettazione con la comunità, valorizzando il ruolo attivo dei cittadini nelle decisioni legate al territorio e all'innovazione tecnologica. Anche il caso di Valencia dimostra come, per una gestione efficace, sia necessario considerare la rappresentanza di interessi legati alla sostenibilità e alla cittadinanza attiva. Questo approccio considera il territorio rurale parte integrante di un piano strategico che coinvolge l'intera comunità, valorizzando la ruralità non come periferia ma come risorsa fondamentale (Gupta et al., 2017).

In una *governance* smart (Donolo, 2020), la digitalizzazione è un mezzo per raccogliere e analizzare dati relativi al patrimonio culturale, architettonico e naturale, creando banche dati accessibili a tutti gli attori territoriali per nuove progettualità. Alcune valutazioni della *governance* potrebbero prevedere la digitalizzazione come *H-Bim* del patrimonio proprio come fatto a Veberöd[1] in Svezia non solo per avviare un controllo del patrimonio, ma anche per monitorarlo e valutare gli impatti che alcune soluzioni tecnologiche potrebbero subire se integrate. La mappatura del patrimonio, infatti, consente di identificare risorse ancora non sfruttate e di pianificare interventi di recupero e restauro che siano rispettosi dell'identità locale. Comprendere lo stato degli edifici, se completamente vetusti, parzialmente recuperabili o già restaurati, permette una gestione più efficiente del patrimonio, combinando valorizzazione culturale, sostenibilità e innovazione. Tecnologie come H-BIM, che catalogano il patrimonio in base a storicità, condizioni e livello di efficienza energetica, forniscono uno strumento essenziale per la gestione e il monitoraggio dei beni culturali e naturali (Ebrahimbaysalami 2024).

L'efficienza energetica rappresenta un altro aspetto essenziale nella *governance* smart, applicabile sia agli edifici in uso sia a quelli dismessi. L'adozione di tecnologie avanzate consente di monitorare i consumi energetici e identificare aree di inefficienza, riducendo i consumi e ottimizzando le risorse a vantaggio dell'ambiente e dell'economia locale. In particolare, gli interventi di riqualificazione energetica degli edifici dismessi, mediante la partecipazione a bandi per finanziamenti, possono trasformare spazi inutilizzati in risorse per la comunità, con un impatto positivo sull'efficienza e sulla sostenibilità.

[1] Smart Rural 27. (2024). Veberöd. Retrieved December 6, 2024, from https://www.smartrural27.eu/village/veberod/

In questo contesto, le comunità energetiche rappresentano un modello di sviluppo sostenibile che consente di ridurre la dipendenza energetica esterna e promuovere l'autonomia locale (Lombardo et al., 2024). Riunendo cittadini e imprese per produrre e condividere energia rinnovabile, le comunità energetiche promuovono l'efficienza e la sostenibilità e offrono nuove opportunità economiche per i territori. Tali iniziative, che spesso coinvolgono partnership tra enti locali, università e settore privato, sono essenziali per realizzare soluzioni innovative, migliorare la qualità dei servizi e sensibilizzare la comunità verso un uso responsabile delle risorse.

Un esempio significativo si trova in Finneria, dove alcuni villaggi rurali hanno implementato un sistema di *governance* digitale che gestisce in modo integrato flussi di informazioni, risorse energetiche e attività turistiche. Questo approccio, che vede una stretta collaborazione tra pubblico e privato, crea un ecosistema in grado di migliorare la qualità della vita dei residenti rispettando il patrimonio ambientale.

L'accesso ai fondi europei (European Commission, 2024) costituisce un'opportunità fondamentale per finanziare iniziative di *governance* smart legate alla digitalizzazione, all'efficienza energetica, alla valorizzazione del patrimonio e alla partecipazione civica. Tuttavia, per sfruttare al meglio queste risorse, è necessario che le amministrazioni locali dispongano delle competenze adeguate per redigere proposte di finanziamento efficaci (Mack et al., 2020). Questo permette di implementare progetti innovativi che migliorano la qualità dei servizi offerti ai cittadini e promuovono un modello di sviluppo economico sostenibile.

Inoltre, è fondamentale evidenziare l'importanza di una comunicazione efficace tra *governance* e cittadinanza. Un dialogo più ampio favorisce il senso di partecipazione e agevola la promozione delle iniziative. Una maggiore interazione implica una collaborazione più stretta e una maggiore predisposizione a intraprendere attività comuni, contribuendo a percepire l'ente di *governance* non come distante, ma come una realtà vicina e integrata nella vita dei cittadini.

Una *governance* smart si basa sull'uso strategico della tecnologia per migliorare l'efficienza, la partecipazione e la sostenibilità delle politiche pubbliche. La digitalizzazione dei processi decisionali, la valorizzazione del patrimonio, il monitoraggio energetico, le comunità energetiche e l'accesso ai fondi europei rappresentano strumenti chiave per creare un modello di gestione territoriale inclusivo e innovativo. Questa combinazione di elementi favorisce lo sviluppo di comunità resilienti, pronte ad affrontare le sfide contemporanee e a costruire un futuro sostenibile.

Fig. III.1.2.1 | Il Sindaco di Isnello, Marcello Catanzaro, apre le porte della città ai partecipanti della Summer School ©SIAS2, 2024

III.1.3 Recupero e valorizzazione del patrimonio materiale e immateriale

Se la comunità e la *governance* svolgono un ruolo decisivo, anche il patrimonio architettonico seppure non considerabile come elemento attivo del territorio, in maniera passiva costituisce uno degli aspetti fondamentali da tenere in considerazione (Claval, 2012). Il patrimonio, sia materiale che immateriale, costituisce una risorsa fondamentale per le comunità locali (ICOMOS, 1999), poiché rappresenta non solo la memoria storica e culturale di un territorio, ma anche un potenziale strumento di sviluppo economico e sociale (Sardaro et al., 2021).
Per quanto riguarda il patrimonio immateriale, la digitalizzazione si configura come uno degli strumenti più potenti per la valorizzazione e la gestione, poiché consente di raccogliere, conservare e diffondere informazioni storiche, artistiche e culturali in modo accessibile e fruibile da un pubblico globale. La creazione di archivi digitali, musei virtuali (Yang et al., 2021) e piattaforme interattive, nonchè la possibilità di fruire grazie a realtà virtuale e aumentata del patrimonio, non solo lo preserva, ma lo rende anche fruibile in modalità innovative, ampliando la possibilità di fruizione a un pubblico più ampio e diversificato (Yang et al., 2023). La digitalizzazione delle tradizioni locali, dei mestieri e dei linguaggi tramandati oralmente contribuisce a conservare e promuovere l'identità culturale, permettendo di raccogliere testimonianze e tradizioni che altrimenti potrebbero andare perdute.

La promozione di eventi, sagre e festival legati alla tradizione e alla cultura locale accompagna questo processo e rappresenta un altro aspetto fondamentale per la valorizzazione del patrimonio immateriale, in particolare per il turismo lento (Brunoti et al., 2022); occasioni del genere possono, infatti, oltre che arricchire il paese, generare occasioni di vivacità e di riscoperta delle tradizioni locali. Questi eventi, che celebrano le tradizioni enogastronomiche, artigianali e folkloristiche, sono occasioni uniche per coinvolgere i residenti e attrarre visitatori sensibili alla cultura autentica e al turismo sostenibile. Attraverso una gestione attenta e mirata di questi eventi, le comunità possono stimolare l'economia locale, promuovere la partecipazione attiva della cittadinanza e sensibilizzare il pubblico verso un tipo di turismo più rispettoso dell'ambiente e delle tradizioni locali (Salemink et al., 2017). Inoltre, il turismo lento (Moscarelli et al., 2023), come già accennato nella parte introduttiva a questo capitolo, permette di scoprire e apprezzare in profondità le caratteristiche distintive di un territorio, raccontando la vocazione territoriale e riducendo l'impatto del turismo di massa e offrendo esperienze più autentiche e immersive. Ecco perchè patrimonio materiale e immateriale sono in perfetta sinergia; eventi popolari e religiosi potrebbero, infatti, avviare meccanismi virtuosi di recupero e valorizzazione sul patrimonio costruito presente.

Per quanto concerne, invece, il patrimonio materiale, la tutela e valorizzazione del patrimonio costruito richiede un approccio più tecnico e strutturato, che possa garantire la conservazione del patrimonio architettonico senza compromettere il suo valore storico e culturale (Galderisi et al., 2021). A tal fine, l'adozione di manuali, linee guida, atlanti e codici di pratica diventa essenziale per la gestione dell'architettura tradizionale e dei siti di valore storico architettonico come i piccoli contesti urbani ben conservati (Onesti, 2021). In primis, questo permette di conoscere il modo in cui intervenire, al contempo, diffonde e promuove pratiche di recupero sostenibili e compatibili. Questi strumenti forniscono linee guida precise su come intervenire in modo conservativo e rispettoso, promuovendo interventi di recupero che siano al tempo stesso efficaci e compatibili con la sostenibilità (Borri et al., 2001). É quanto previsto dall'ultima Legge della Regione Siciliana che prevede per i nuovi PRG da approvare nei prossimi cinque anni documenti a supporto per intervenire sul patrimonio. La conservazione del patrimonio edilizio non è solo una questione di estetica, ma di rispetto per l'identità storica, architettonica e culturale di un luogo, e deve quindi essere guidata da principi di buona pratica che siano coerenti con le normative di tutela e

con le esigenze della comunità. L'esempio di Polizzi Generosa e quello per il comparto Madonita, elaborati per la seguente tesi dottorale, rappresentano due strategie chiave per capire in che modo intervenire con il patrimonio architettonico locale.

Le strategie di riuso del patrimonio esistente rappresentano un'altra area di grande importanza, soprattutto in un contesto di sostenibilità e innovazione sociale. Se la *governance* e la comunità sono a conoscenza delle potenzialità del territorio, possono essere anche altrettanto propositivi in merito alla gestione delle risorse in maniera consapevole valutando l'opportunità di ridargli vita (Pinto, 2004). Rimetterli in piedi, recuperarli e dargli una nuova funziona o promuovendo nuove occasioni lavorative per il territorio. In questo ambito, progetti come gli ecovillaggi (Gilberto, 2012), le strutture ricettive eco-sostenibili e il *cohousing* per over 65 sono esempi di come il patrimonio edilizio possa essere riutilizzato in modo creativo, mantenendo la sua funzionalità originale, ma adattandolo alle esigenze moderne. Gli ecovillaggi, ad esempio, offrono soluzioni abitative basate su principi ecologici, creando comunità autosufficienti che promuovono l'uso di energie rinnovabili e la gestione responsabile delle risorse naturali. Così come la pratica del recupero ewmulando le tecniche costruttive locali e promuovendo edifici tradizionali. Allo stesso modo, il *cohousing* per over 65 risponde a una crescente esigenza sociale, offrendo spazi abitativi condivisi che favoriscono l'integrazione intergenerazionale, la cura reciproca, lo scambio di skills, e, in ultimo, il benessere degli anziani cittadini di questi piccoli contesti.

Infine, gli *hub* creativi e di innovazione per la comunità locale svolgono un ruolo cruciale nel favorire la crescita economica, la creatività e l'innovazione sociale. Questi spazi, che possono ospitare artisti, start-up e imprese sociali, offrono opportunità di formazione, networking e sviluppo per le persone che desiderano avviare progetti innovativi o culturali. Attraverso la creazione di centri di innovazione e incubatori di idee, le comunità locali possono stimolare la produzione di valore aggiunto in settori chiave come l'artigianato digitale, la sostenibilità e la tecnologia, con un impatto positivo sul tessuto economico e sociale, nonché elaborare strategie e percorsi da seguire per la valorizzazione del territorio. Gli *hub* creativi non solo favoriscono l'occupazione e l'integrazione, ma contribuiscono anche a una trasformazione culturale e sociale, in cui la comunità diventa attivamente coinvolta nella definizione e nella realizzazione del proprio sviluppo futuro.

La valorizzazione del patrimonio materiale e immateriale attraverso la digitalizzazione, la promozione di eventi culturali, la tutela del patrimonio costruito, le strategie di riuso e la creazione di *hub* creativi rappresentano un insieme di pratiche che contribuiscono in modo significativo alla sostenibilità e alla crescita delle comunità locali. Questi approcci, se integrati in un piano di sviluppo territoriale coerente, non solo conservano e promuovono l'identità culturale, ma stimolano anche l'innovazione sociale ed economica, creando un equilibrio tra tradizione, modernità e sostenibilità.

Nell'ambito della tesi, un approccio utile, per promuovere il recupero e la valorizzazione dell'architettura locale, è stata l'elaborazione di uno strumento come le Linee Guida, concepito per supportare la conservazione del patrimonio costruito e per promuovere la conoscenza di strumenti, soluzioni tecnologiche e metodologie innovative applicabili al patrimonio locale del Comune di Polizzi Generosa. Questo strumento si propone di sensibilizzare i cittadini verso un modello di sviluppo integrato, basato sulla raccolta e sistematizzazione di attività e ricerche pregresse per valorizzare l'architettura tradizionale e incentivare un approccio consapevole e sostenibile al recupero del territorio.

Le Linee Guida rappresentano un riferimento per orientare interventi compatibili con le peculiarità dei contesti rurali e urbani, tenendo conto delle specificità materiali, culturali e paesaggistiche. Inoltre, attraverso l'adozione di nuove tecnologie e la promozione di pratiche collaborative tra comunità locali e amministrazioni, lo strumento mira a potenziare la capacità del territorio di adattarsi ai cambiamenti, conservando al contempo l'auten-

ticità e l'identità culturale dei luoghi.

Un aspetto centrale di questo approccio è il coinvolgimento attivo delle comunità locali, incoraggiando la partecipazione diretta nei processi decisionali e promuovendo un dialogo costruttivo tra esperti, amministratori e cittadini. Questo dialogo non solo favorisce una maggiore consapevolezza del valore del patrimonio costruito, ma contribuisce anche a delineare strategie condivise per il suo recupero, salvaguardia e valorizzazione, in un'ottica di sostenibilità e innovazione.

Attraverso le Linee Guida, che saranno affrontate nel paragrafo successivo, si auspica di stimolare un modello di gestione integrata capace di coniugare tradizione e modernità, trasformando il patrimonio locale in una risorsa dinamica per lo sviluppo economico, culturale e sociale delle comunità.

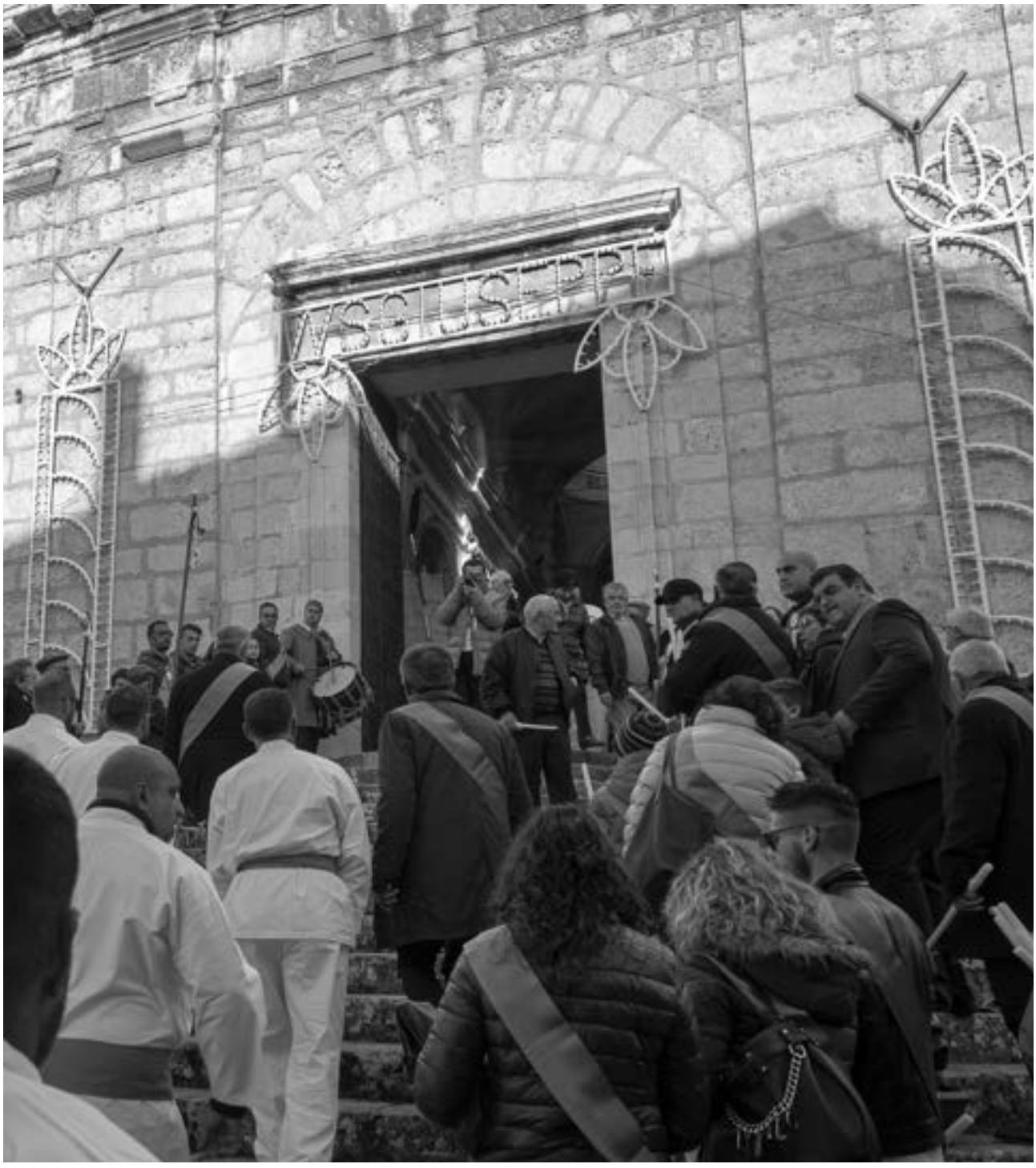


Fig. III.1.3.1 | Processione di San Giuseppe a Polizzi Generosa ©Michele Tumminello, 2022

III.1.3.1 Linee guida per il recupero del centro storico di Polizzi Generosa

Al fine di mettere a sistema la ricerca condotta in Italia e all'estero, di concerto con il tutor aziendale della Soprintendenza BB. CC. AA. Di Palermo, l'Arch. Delia Geraci, si è deciso di elaborare, durante il periodo all'estero, un manuale di recupero, denominato linee guida, per il centro storico del Comune di Polizzi Generosa, individuato come caso pilota dell'area madonita, e provare a mettere a sistema la metodologia valenciana, considerata *smart*, relativa ai manuali di recupero dei centri minori. Costituisce il risultato della collaborazione tra Soprintendenza BB.CC.AA. della Provincia di Palermo, del Comune di Polizzi Generosa e dell'affiancamento dell'Ufficio Tecnico del Comune di Polizzi Generosa.

La conservazione e il recupero dei centri storici sono obiettivi di primaria importanza per preservare il patrimonio culturale e architettonico di Valencia. Affinché tali sforzi abbiano successo, è essenziale creare manuali accessibili, brevi ed intuitivi, in grado di guidare sia gli esperti che il pubblico in questo complesso processo di recupero e conservazione.

Questa chiave di lettura è stata osservata più volte nei contesti rurali:

- *Renovar conservando. Manual para la restauracióm de la arquitectura rural del Rincón de Ademuz* di Vegas F. e Mileto C., 2007
- *La arcuitectura popular de Peniscola. Manual de restauracion del centro historico* di Balaguer P. e Vicen L., 2011
- *Patrimoni arquitectònic de Benicarló. La memoria compartida.* di Aicart Queralt J.M., Onda Edicions, 2020
- *Manual de Buenas Prácticas Constructivas del centro histórico de Borriol* di Arquer N., Linares J.C., Palmer J., 2020
- *Rehabilitando El Cabanyal. Un recorrido arquitectónico por el barrio de El Cabanyal* di Mileto C. e Vegas F., 2023

Manuali considerati *smart* per la conservazione e il recupero dei centri storici valenciani in quanto combinano chiarezza, accessibilità e una forte componente visuale. Costituiscono strumenti efficaci per guidare il recupero e la conservazione di uno dei patrimoni culturali più preziosi di Valencia in modo intuitivo e accessibile a tutti. tale consapevolezza nasce anche alla luce di tantissimi libri sul recupero e la valorizzazione di contesti territoriali che negli anni sono stati elaborati anche per il caso italiano.

I volumi analizzati, nel dettaglio, si aprono con una descrizione del contesto storico e culturale dei paesi. Segue una descrizione dell'architettura tradizionale rurale della regione, le tecniche di recupero e conservazione dell'architettura rurale, che includono la riparazione di lesioni, la sostituzione di elementi mancanti e la manutenzione ordinaria e straordinaria. Concludono con una serie di raccomandazioni volte ad individuare le azioni future da intraprendere e le modalità con cui è possibile operare. Queste includono la necessità di coinvolgere la comunità locale nel processo di restauro, la necessità di utilizzare materiali e tecniche tradizionali e la necessità di garantire che gli edifici restaurati siano utilizzati in modo sostenibile.

Le caratteristiche chiave che rendono questi efficaci sono:

- **struttura chiara e modulare:** Un manuale *smart* per la conservazione e il recupero dei centri storici dovrebbe essere strutturato in modo logico e modulare. Ogni sezione dovrebbe trattare un aspetto specifico del recupero. Questa struttura facilita la consultazione delle informazioni rilevanti.
- **testo semplice e accessibile:** Il linguaggio utilizzato dovrebbe essere semplice, evitando la terminologia tecnica complessa. Le spiegazioni dovrebbero essere concise e facilmente comprensibili da chiunque, indipendentemente dal livello di competenza nel settore. Un glossario conclusivo garantisce la comprensione di termini a volte troppo complessi o autoctoni e, dunque, non per tutti di facile comprensione.
- **abbondanza di immagini e grafici:** Le immagini, le mappe, gli schemi e i grafici sono fondamentali per illustrare i concetti in modo chiaro ed efficace. Le foto/rendering prima e dopo i gli interventi di recupero

possono mostrare visivamente l'efficacia delle strategie.
- **esempi pratici e case study:** I manuali dovrebbero includere numerosi esempi pratici tratti da esperienze reali di conservazione e recupero dei centri storici e buone pratiche anche riscontrate in altri contesti territoriali. Questi esempi possono dimostrare come le strategie possono essere applicate con successo e forniscono ispirazione.
- **risorse aggiuntive:** Una sezione dedicata alle risorse aggiuntive, come siti web, documenti tecnici, organizzazioni di supporto e contatti utili, può fornire ulteriori informazioni e assistenza pratica. Promuovere anche l'accassibilità
- **evidenziare successi e risultati positivi:** L'accento dovrebbe essere posto su esempi di successo e risultati positivi ottenuti attraverso la conservazione e il recupero dei centri storici. Questo può motivare e ispirare gli *stakeholder* locali e le comunità.
- **design visivamente accattivante:** Il manuale dovrebbe avere un design visivamente accattivante con un layout pulito e ben strutturato al fine di creare un ambiente di studio e di analisi quanto più chiaro e adeguato all'utente che lo sfoglia. Le immagini dovrebbero essere di alta qualità e ben integrate nel testo, nonchè commisurate al tipo di idea, soluzione o analisi che deve essere affrontata.
- **accessibilità digitale:** Per raggiungere un pubblico più ampio, il manuale potrebbe essere disponibile in formato digitale, accessibile su dispositivi mobili e computer, facilitando così la consultazione in loco durante i lavori di recupero, ma anche ex ante, nella fase progettuale.

Le linee guida di Polizzi Generosa, pertanto, sono state realizzate rimodulando la struttura qui proposta e attuando la metodologia incontrata nello studio dei documenti a supporto. L'importanza di questi contesti territoriali, come i piccoli paesi dell'entroterra, è evidente sia alla scala territoriale che alla scala edilizia elementi come portici, strade, cinte murarie, edifici, comuni sia alle Madonie che al comparto valenciano, così come palazzetti, case rurali, castelli e complessi monastici, chiese, conventi ed edifici pubblici arricchiscono il bellissimo paesaggio madonita, rendendolo unico. L'indagine che si è voluta affrontare è di carattere storico/critica così come storico/tecnica. L'analisi dell'architettura di base, e lo studio di ricerca pregresso legato al tema, analizza il lessico costruttivo locale per individuare i possibili interventi di recupero nel rispetto dell'istanza storica delle tecniche costruttive. Una comprensione unitaria e operativa del contesto territoriale che ha il precipuo obiettivo di conservare e valorizzare il paese nel suo complesso configurando destinazioni d'uso compatibili e soluzioni tecnologiche con il patrimonio edilizio esistente.
Gli obiettivi delle Linee Guida sono:
1. promuovere uno sviluppo sostenibile che integri le esigenze di conservazione del patrimonio storico-culturale con le necessità di modernizzazione e innovazione tecnologica;
2. garantire la sicurezza e il benessere dei residenti attraverso interventi di adeguamento del patrimonio costruito alla tradizione costruttiva locale;
3. incentivare la partecipazione attiva delle comunità locali nella conoscenza dei manufatti architettonici, nella pianificazione e realizzazione di progetti di recupero;
4. rafforzare la resilienza economica e sociale delle aree interne, supportando la valorizzazione dell'architettura locale;
5. utilizzare in modo efficace i fondi comunitari e nazionali, attraverso una *governance* trasparente e una pianificazione finanziaria oculata, assicurando la massimizzazione dell'impatto delle risorse disponibili e il rispetto del patrimonio architettonico.

I vincoli presenti a Polizzi di carattere paesaggistico ed archeologico sono opportunità progettuali e il recupero, in questo caso, si configura come punto di partenza che fornisce una panoramica delle tecniche costruttive tradizionali per una conoscenza critica dei manufatti, ma soprattutto per

[1] ICOMOS, Consiglio Internazionale dei Monumenti e dei Siti, è un'organizzazione non governativa advisory body dell'UNESCO. La sua missione è quella di promuovere la conservazione, la protezione, l'uso e la valorizzazione di monumenti, complessi costruiti e siti.

un principio di operabilità. Si dice, infatti, *conoscere per conservare*, al fine di creare professionisti della tutela per non sottovalutare il passato ed evitare qualsiasi tipo di libertà artistica e fornire ricadute operative pratiche, individuare, tout court, la via più adatta da seguire.

Negli anni '80 Paolo Marconi individuava la storia dell'architettura come la storia delle tecniche costruttive considerando opportuno l'approccio multidisciplinare da perseguire. Le linee guida non sono statiche, ma forniscono una visione dinamica e aperta del patrimonio costruito.

Non è una mera descrizione dell'architettura, ma non sono altro che l'*upgrade* di quanto è già stato fatto già negli ultimi anni di Ricerca nel comparto madonita. fornisce delle ricadute operative da sviluppare al fine di conservare e tutelare il patrimonio presente considerando non solo il paese, ma anche il paesaggio e i beni isolati sparsi nel territorio che sono figli di una stessa matrice progettuale, compositiva e costruttiva. La metodologia che persegue parte da un approccio simile ai manuali valenciani, dunque, lo studio delle peculiarità architettoniche presenti, introducendo la parte operativa fatta di soluzioni e scelte progettuali da applicare nel caso studio di Polizzi Generosa.

La componente innovativa è la scrematura delle difformità presenti nell'architettura secondo il principio di contestualizzazione dei manufatti, elementi molto siffusi nelle Madonie, e che costituiscono un passo importante per i processi conservativi e dunque, per il recupero e la valorizzazione dei territori, coniugando in un'ottima *smart*, tradizione e innovazione. Il manuale redatto si incentra, in prima battuta, sull'analisi dell'edilizia di base del comprensorio madonita e sulle presenze architettoniche del contesto di Polizzi Generosa, analizzando tutte le peculiarità del patrimonio costruito,

Fig. III.1.3.1.1 | Metodologia e sviluppo delle linee guida per il Comune di Polizzi Generosa ©Luisa Lombardo, 2024

un *excursus* del lavoro passato. Si occupa poi di definire i parametri necessari per il mantenimento del decoro urbano ed architettonico, delineando, attraverso la tecnica del semaforo, e dunque con i colori giallo, rosso e verde, la possibilità di evidenziare tutte le difformità presenti e trovare una soluzione per il recupero e la valorizzazione del borgo. Sono forniti, altresì, ulteriori esempi pratici di soluzioni tecnologiche riscontrate nel territorio madonita, ma anche nel contesto valenciano. Infine, l'ultima parte delle Linee Guida, fornisce alcune raccomandazioni che riguardano il tema dell'accessibilità e dell'arredamento dei bar e chioschi al fine di individuare delle linee di indirizzo da seguire per il recupero del contesto urbano.

Al termine, un glossario intende aiutare i "non addetti ai lavori" o i tecnici in erba che disconoscono alcuni termini tecnici, nella comprensione dei vocaboli siciliani di recupero del patrimonio architettonico tipico dell'area delle Madonie. A partire dalle Linee Guida pensate per il Comune di Polizzi e perseguendo la medesima metodologia sarà possibile, così, avviare un percorso virtuoso per la costituzione di ulteriori manuali per gli altri venti comuni afferenti all'area oggetto di studio, ma anche per altri contesti rurali con caratteristiche simili per analogia o per contrasto. Di seguito vengono riportare delle schede riepilogative con la struttura e la metodologia applicata all'interno delle linee guida proposte.

Fig. III.1.3.1.2 | Autunno in un palazzo nobiliare a Polizzi Generosa ©Michele Tumminello, 2022

III.1.3.1.1 Metodologia adottata per la spiegazione delle Linee Guida

Le linee guida elaborate per il recupero e la valorizzazione del comune di Polizzi Generosa sono strutturate per essere facilmente comprensibili e applicabili agli interventi sul territorio.
L'indice è articolato in diverse sezioni che coprono vari aspetti del territorio e dell'architettura locale. Dopo un'introduzione che fornisce il contesto e gli obiettivi del documento, si esplora l'architettura di base del comune, con focus su unità abitative, materiali e tecniche costruttive tipiche della zona, come apparecchi murari, balconi, aperture e coperture. Il capitolo successivo riguarda i valori identitari e il decoro urbano, con strategie per la salvaguardia del patrimonio e il miglioramento dell'aspetto urbano. Un altro capitolo è dedicato al patrimonio protetto e ai vari gradi di intervento, evidenziando la classificazione del patrimonio edilizio e le relative normative di intervento. La sezione delle "Linee guida di intervento" esplora dettagliatamente gli aspetti più pratici delle riqualificazioni, con indicazioni specifiche per il centro storico, le elevazioni fuori terra e l'arredo urbano, così come per gli interventi sul territorio comunale, tra cui edifici sparsi e infrastrutture. Particolare attenzione è dedicata alle buone pratiche, all'abbattimento delle barriere architettoniche e all'accessibilità, con tavole sinottiche che riassumono gli interventi suggeriti.

Infine, il documento si conclude con delle riflessioni finali e un glossario per chiarire i termini tecnici utilizzati.

0_Abstract
1_ Introduzione e obiettivi
- Introduzione
- Il Parco delle Madonie
- Polizzi Generosa
- Obiettivi delle Linee Guida
- Bibliografia

2_L'architettura di base di Polizzi Generosa
- 2.1_Architettura di base di Polizzi Generosa
  - Unità abitative
- 2.2_Materiali e tecniche costruttive
  - Apparecchi murari
  - Cantonali
  - Balconi
  - Aperture su strada
  - Apertiure e vani di finestra
  - Portali
  - Coperture
  - Cornicioni, pluviali e sistemi di smaltimento delle acque meteoriche
  - Impaginato dei prospetti su strada (intonaci e rivestimenti, ...)
  - Solai di interpiano
  - Catene metalliche e capochiavi
  - Scale
  - Controsoffitti e Partizioni interne
  - Pavimentazioni stradali
  - Bibliografia

3_Valori identitati e Decoro urbano
- Strategie per la salvaguardia e il raggiungimento del decoro urbano e architettonico

4_Patrimonio protetto e gradi di intervento
- Patrimonio protetto
- Patrimonio catalogato e edilizia residenziale
- Quadro riassuntico dei gradi di intervento e tavole grafica
- Elenco dell'edilizia catalogata

5_Riferimenti normativi e Linee guida di intervento
- 5.1_Codice dei Beni Culturali e del Paesaggio n°42/2004 - DPR 31/2017
- 5.2_Regolamento edilizio del Comune di Polizzi Generosa
- 5.3_RAU - Regolamento Comunale Arredo Urbano: norme di valorizzazione e di gestione del paesaggio urbano
- 5.4_Linee guida di intervento e Raccomandazioni
  - **Centro Storico - Prospetti**
    - Porzioni di attacco a terra e basamentali
    - Balconi
    - Intonaci

Serramenti
Sistemi di smaltimento delle acque meteoriche, gronde e pluviali
Cassette della posta
Sportelli e cassette per acqua e gas
Verande e pensiline
Centro Storico - Ultime elevazioni fuori terra
Coperture
Ultime elevazioni fuori terra: inserimento di verande, tettoie e altri sistemi di chiusura di lastrici solari e balconi
Canne fumarie
Antenne radio-televisive e parabole
Centro Storico - Arredo urbano
Fontanelle, panchine e cestini
Fioriere
Insegne e segnaletica monumentale
Tende e sistemi di protezione dal sole e ombreggiatura
Illuminazione pubblica
Pavimentazione
Territorio comunale
Tipologie architettoniche sparse nel territorio
Infrastrutture e segnaletica
Cartella RAL Classic
5.5_Individuazione di buone pratiche da seguire desunte da altri contesti
5.6_Abbattimento delle barriere architettoniche e accessibilità allargata
5.7_Tavole sinottiche degli interventi
6_Conclusioni
7_Glossario dei termini utilizzati

Per approfondire, si rimanda all'**Allegato n°3** presente in Appendice

Recuperare l'architettura di base madonita
Linee guida per Polizzi Generosa

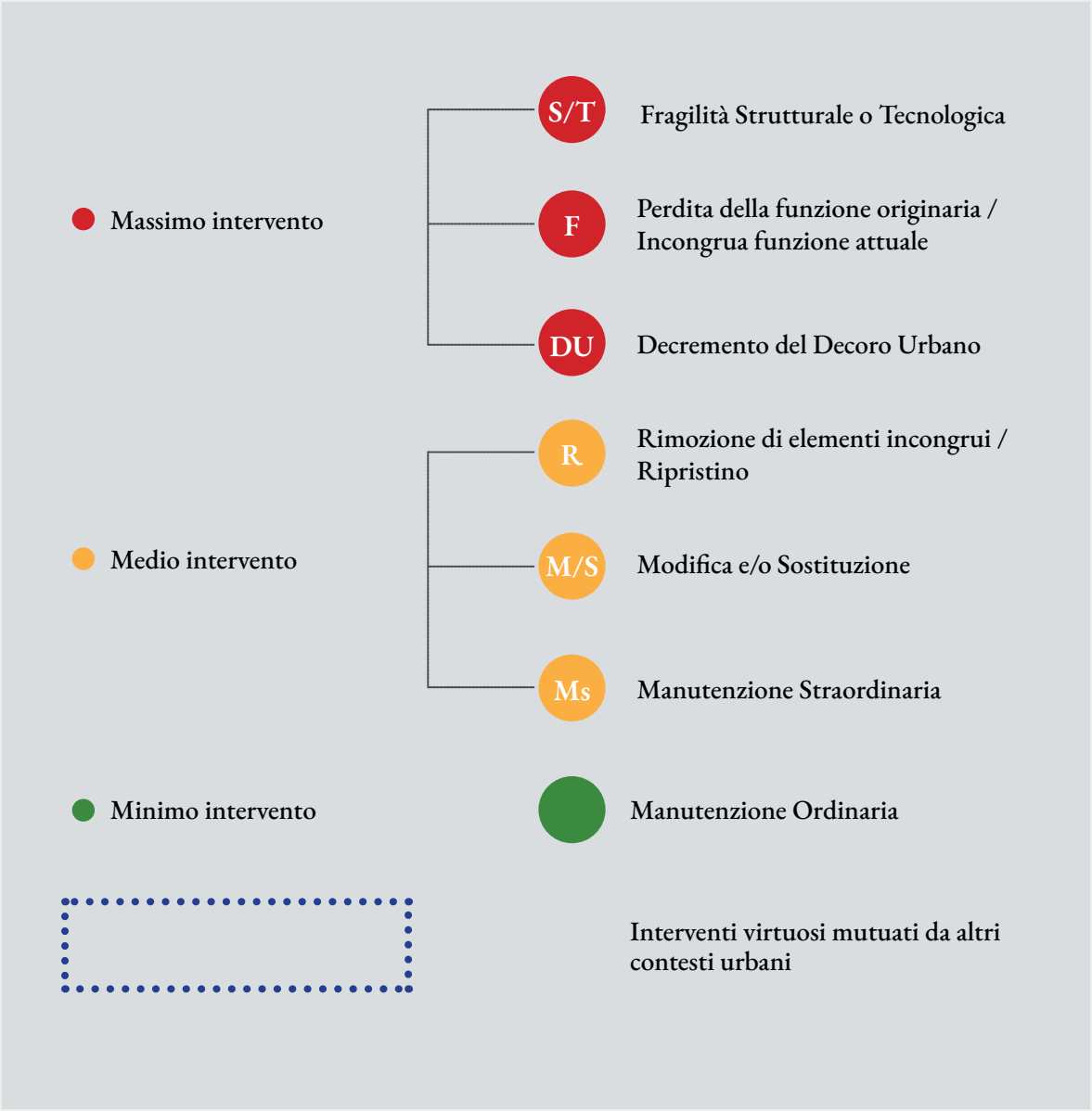
La metodologia adottata per la loro lettura si articola in due fasi principali. In primo luogo, si procede con una disamina approfondita delle caratteristiche materico-costruttive presenti, al fine di comprendere i tratti distintivi del territorio e di identificare le specificità che ne caratterizzano l'identità. Tale analisi risulta fondamentale per contestualizzare gli interventi e garantire che le soluzioni proposte rispettino e valorizzino il patrimonio esistente.

Successivamente, un sistema a colori, ispirato al concetto di "semaforo", viene utilizzato per classificare i tipi di intervento necessari. Il colore rosso identifica gli interventi di massima urgenza, relativi a situazioni di fragilità strutturale, perdita della funzione originaria o incongruità della funzione attuale del dettaglio architettonico, nonché a casi di degrado urbano significativo. Gli interventi in giallo, di entità media, indicano situazioni che richiedono la rimozione, modifica, sostituzione o manutenzione straordinaria di elementi, rappresentando un livello di complessità intermedia. Infine, gli interventi in verde sono quelli di minima entità, risolvibili con interventi di manutenzione ordinaria o con spese contenute.

In aggiunta, gli interventi sono contornati in blu quando si fa riferimento a soluzioni adottate in altri territori locali o in contesti simili, che potrebbero risolvere problematiche analoghe, suggerendo strategie virtuose applicabili al caso specifico.

In basso, vengono riportati gli schemi di cui si è parlato, insieme alla tabella che dettaglia le specifiche per ogni tipologia di intervento, al fine di fornire una guida chiara e operativa per gli interventi sul campo.

Nella scheda successiva l'esempio elaborato per le coperture presenti nel Comune di Polizzi Generosa e un esempio di analisi di prospetto di Vicolo Cilluffo .



Massimo intervento

Sono interventi che richiedono l'impiego di una figura professionale, un tecnico, o di una squadra edile per risolvere la problematica riscontrata. Il singolo cittadino, o proprietario di casa che sia, non può risolverlo autonomamente.

S/T: Vulnerabilità strutturale o scarse prestazioni tecnologiche
Si riferisce alla struttura dell'edificio o a un elemento caratterizzato da proprietà non conformi alle peculiarità del costruito storico, risultato di scelte progettuali ed esecutive inadeguate o insufficientemente attente alla specificità del contesto architettonico e culturale.

F: Perdita della funzione originaria / Incongrua funzione attuale
L'edificio si presenta privo di una funzione specifica e richiede interventi che coniughino trasformazione e conservazione, privilegiando il mantenimento delle caratteristiche originarie ove possibile. Nel caso in cui le funzioni originarie non siano più sostenibili o compatibili con le esigenze attuali, è necessario individuare nuovi utilizzi che rispettino le peculiarità dell'edificio e ne valorizzino l'identità storica e architettonica. Gli interventi devono mirare a reintegrare gli elementi preesistenti, armonizzandoli con soluzioni contemporanee che siano compatibili con il contesto e ne garantiscano una fruizione attuale.

DU: Perdita del Decoro Urbano
Un degrado evidente che, oltre a evidenziare errori tecnologici, si manifesta attraverso la perdita dei caratteri identitari dell'edificio. La sostituzione di elementi originali con componenti incongruenti, estranei e avulsi dal contesto, compromette l'armonia complessiva e deturpa il paesaggio, generando un impatto negativo tanto visivo quanto culturale.

Medio intervento

Sono interventi che il proprietario può risolvere autonomamente o, in alcuni casi, con una squadra edile, volti al miglioramento del decoro urbano e architettonico attraverso la rimozione, la modifica o manutenzione del manufatto o la tinteggiatura.

R: Rimozione di elementi incongrui / Ripristino
L'elemento riscontrato necessita di un'immediata rimozione perchè considerato elemento di disturbo per il manufatto architettonico.

M/S: Modifica e/o Sostituzione
L'elemento può essere modificato o manutenuto al fine di rispondere ai criteri di decoro urbano o architettonico.

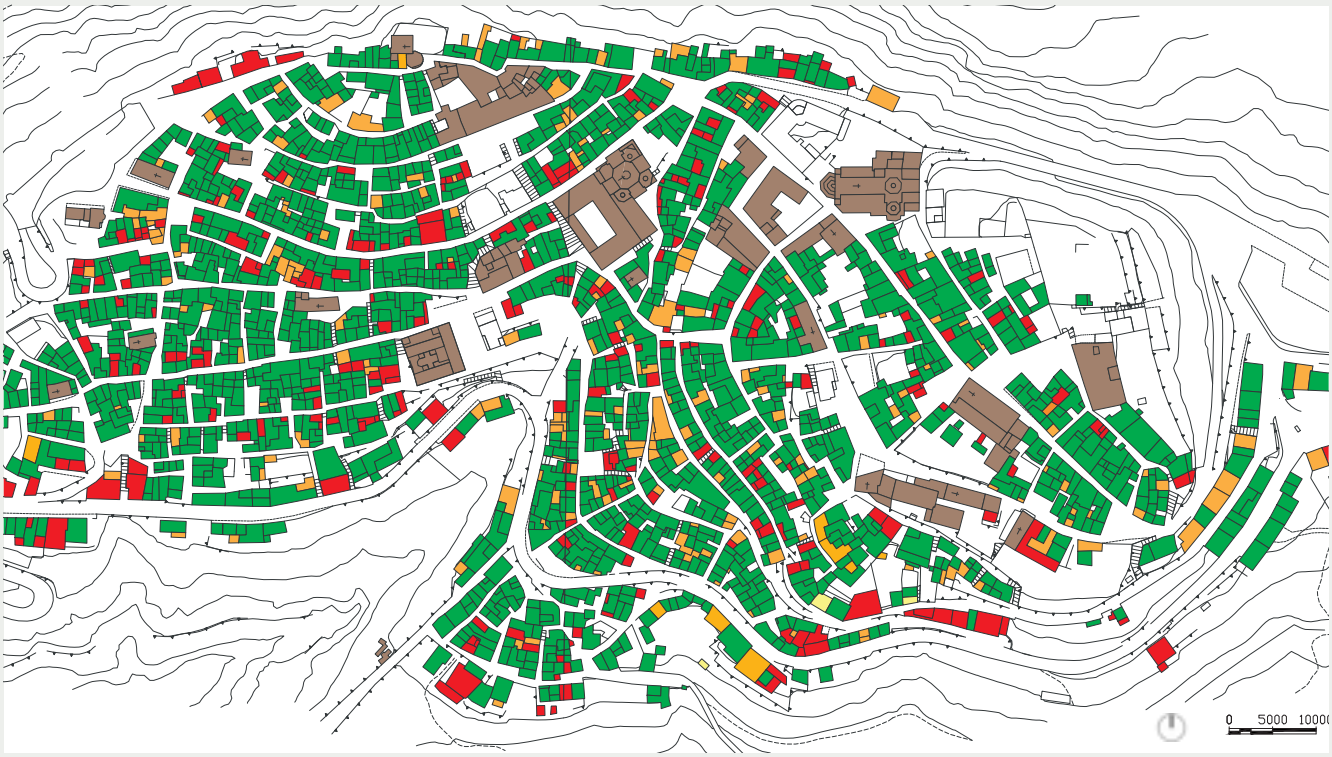
T: Manutenzione Straordinaria
Attraverso la tinteggiatura dell'elemento o alla modifica della colorazione è possibile ricorrere ad una soluzione definitiva o, parzialmente, corretta per rispondere ai criteri di decoro urbano o architettonico.

Minimo intervento

Manutenzione Ordinaria:
L'elemento è corretto e perfettamente integrato nel contesto urbano, le migliorie da apportare sono molto piccole, ma non è di disturbo per l'ambito urbano o per il manufatto architettonico. Può non subire alcuna trasformazione e rimanere tale e quale.

Interventi virtuosi mutuati da altri contesti urbani

Laddove non si riscontra una buona pratica in loco si propone una buona pratica introdotta in altri contesti.



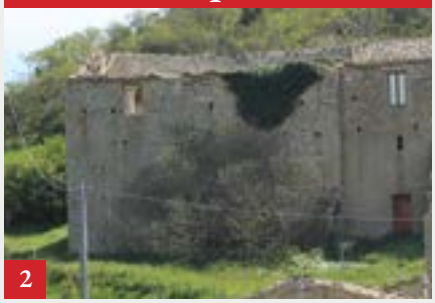
S/T

1. Manto di copertura: Copertura piana, tecnologicamente errata;

2. Chiusura orizzontale: Crollo della copertura e perdita della sua funzione madre;

3. Manto di copertura: Copertura non ricoperta da coppi;

F



1. Superfetazione aggiunta: Veranda in copertura, da rimuovere;

2. Protezione lastrici solari: Tettoia in lamierino e non in coppi, da modificare;

3. Manto di copertura: Colore e materiale della copertura non conforme ai caratteri tecnico-costruttivi dell'architettura di base;

DU

Le tre coperture sono tre esempi virtuosi di coperture che rispettano la giacitura e che utilizzano un manto di copertura in coppi siciliani;

R

M

T

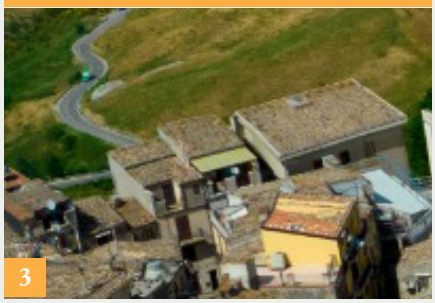


Fig. III.1.3.1.3 | Disamina delle Coperture di Polizzi Generosa ©Luisa Lombardo, 2024

S/T

F

DU

R

Ms

Ms

1. Infissi esterni verticali: Mancanza di infissi;

2. Partizioni interne: Crollo del solaio di interpiano;

3. Infissi esterni verticali: Chiusura del vano finestra;

1. Sistemi per il convogliamento dei fumi: Canna fumaria non integrata nel prospetto, da tinteggiare;

2. Pareti perimetrali verticali: Presenza di patina biologica nel prospetto, da ripristinare;

3. Pareti perimetrali verticali: Alterazione cromatica, da tinteggiare;

1. Manto di copertura: Copertura conforme alle peculiarità tecnico-costruttive dell'area;

2. Pareti perimetrali verticali: Paramento murario ben recuperato;

3. Pareti perimetrali verticali: Casa terrana con paramento murario a faccia vista, ben conservato;

Fig. III.1.3.1.4 | Disamina dei prospetti di Vicolo Cilluffo di Polizzi Generosa ©Luisa Lombardo, 2024

Fig. III.1.3.1.5 | Sagra delle Nocciole a Polizzi Generosa ©Luisa Lombardo, 2024

III.1.4 Tecnologia e Digitalizzazione

La tecnologia e la digitalizzazione sono elementi chiave per la valorizzazione, la gestione e lo sviluppo sostenibile delle comunità, in particolare nelle aree rurali e nei piccoli centri. L'adozione di strumenti digitali non solo facilita l'accesso alle informazioni e ai servizi, ma apre anche nuove opportunità per l'integrazione del patrimonio culturale, la sostenibilità energetica e il miglioramento della qualità della vita. Le app e i siti web sono tra i principali strumenti per promuovere il patrimonio culturale, offrendo un canale diretto di comunicazione con i visitatori e consentendo loro di esplorare la storia, le tradizioni, le bellezze naturali e le specificità locali in modo interattivo e coinvolgente. Grazie alla digitalizzazione, è possibile creare piattaforme che permettano ai turisti e ai residenti di scoprire il patrimonio materiale e immateriale in modo innovativo, con tour virtuali, contenuti multimediali e informazioni aggiornate, favorendo una gestione dinamica e partecipativa (Chioni et al., 2024).

Le app e i siti web dedicati possono integrare anche funzionalità utili per la comunità, come la mappatura di percorsi culturali, l'organizzazione di eventi e la promozione di attività turistiche in modo sostenibile, contribuendo così a creare un'esperienza più ricca e interattiva (Buhmann et al., 2023). L'esperienza avviata dal Comune di Polizzi Generosa, tramite il portale visitpolizzigenerosa.it dimostra che è possibile la messa a sistema delle risorse garantendo la conoscenza dei luoghi e delle esperienze ed eccellenze possibili nei territori. Tale lavoro è stato parzialmente svolto in alcuni comuni del comprensorio, tuttavia, merita ulteriori sviluppi ed approfondimenti per coinvolgere gli altri comuni nella partecipazione della messa a sistema delle risorse. Il lavoro così avviato e ampliato può aiutare tutto il comparto a condividere e mettere a sistema quanto di più ha da offrire. Inoltre, l'utilizzo di tecnologie avanzate, come la realtà aumentata, consentirebbe di arricchire le esperienze di visita (Ferretti et al., 2022) con informazioni in tempo reale e contenuti interattivi, facendo vivere ai turisti e ai residenti un'esperienza immersiva che li connette con la storia e la cultura del territorio (Chioni et al., 2023).

Un altro aspetto fondamentale legato alla tecnologia e alla digitalizzazione è la gestione delle risorse energetiche, in particolare tramite la creazione di comunità energetiche digitali. Queste comunità permettono di ottimizzare l'uso dell'energia a livello locale, attraverso il monitoraggio in tempo reale dei consumi, si potrebbero valutare la gestione dei flussi energetici e l'adozione di soluzioni sostenibili come l'energia solare, l'efficienza energetica e l'autoconsumo collettivo. Le tecnologie digitali svolgono un ruolo cruciale nel garantire che le risorse siano gestite in modo efficiente e che gli utenti possano monitorare e controllare i propri consumi energetici in modo autonomo e consapevole. L'adozione di piattaforme digitali per il monitoraggio dell'efficienza energetica consente di raccogliere dati preziosi, analizzare i modelli di consumo e implementare soluzioni per ridurre gli sprechi, contribuendo a una gestione più sostenibile delle risorse locali.

Parallelamente, le tecnologie digitali (Arkhipova et al., 2021) possono migliorare significativamente il decoro urbano, in particolare attraverso l'implementazione di infrastrutture moderne come il Wi-Fi pubblico e la fibra ottica (Liew et al., 2004). Il Wi-Fi pubblico e la fibra ottica sono anche essenziali per facilitare l'accesso alle informazioni turistiche, culturali e amministrative, creando una connessione tra i cittadini, i visitatori e le istituzioni locali (Cisco Systems, 2004). La creazione di una rete di connessione digitale accessibile a tutti non solo migliora la qualità della vita dei residenti e dei visitatori, ma stimola anche lo sviluppo di attività economiche legate all'innovazione e alla creatività. Garantendo altresì l'internazionalizzazione delle peculiarità locali, soprattutto i prodotti che potrebbero, così, avere un bacino di utenza da ogni parte del mondo. Le aree rurali e i piccoli centri, che spesso soffrono di isolamento tecnologico, possono trarre vantaggio da queste soluzioni per ridurre il divario digitale, garantire l'accesso a servizi online, promuovere l'inclusione sociale e attrarre nuove iniziative imprenditoriali.

Infine, la centralizzazione e la gestione delle risorse e dei servizi tramite "control room" (Wood, 2000) rappresentano una soluzione avanzata per il monitoraggio e la gestione in tempo reale delle operazioni locali. Le control room digitali possono centralizzare i dati provenienti da vari sistemi (energia, traffico, sicurezza, servizi pubblici) e fornire informazioni cruciali per le decisioni rapide e informate. La centralizzazione dei dati permette una gestione più efficiente delle risorse e un miglior coordinamento delle attività quotidiane, come la manutenzione delle infrastrutture, la gestione delle emergenze, la pianificazione urbana e la sicurezza pubblica. Le *control room* possono anche integrare sistemi di intelligenza artificiale e analisi predittiva, migliorando la capacità di anticipare e risolvere eventuali problemi prima che diventino critici, garantendo così una risposta tempestiva ed efficace (Barrientos et al., 2021). Proprio per il fatto di essere una zona ad alto rischio sismico, questo consente di monitorare in tempo reale eventuali dissesti idrogeologici e promuovere interventi *ex ante*, possibili disastri nell'ottica di avviare una manutenzione predittiva delle risorse e la valutazione degli interventi da sostenere.

L'integrazione della tecnologia e della digitalizzazione nelle pratiche di gestione del patrimonio, delle risorse energetiche e del decoro urbano offre opportunità significative per lo sviluppo sostenibile delle comunità locali (Passinari et al. 2011). L'uso di app e siti web, la creazione di comunità energetiche digitali, l'implementazione di infrastrutture tecnologiche avanzate come il Wi-Fi e la fibra ottica, e la gestione centralizzata tramite control room sono tutte soluzioni che permettono di migliorare la qualità della vita, favorire l'innovazione, ottimizzare le risorse e garantire un futuro più sostenibile e inclusivo per i territori (Agnoletti, 2014).

L'innovazione tecnologica costituisce un elemento cardine per il progresso e lo sviluppo delle società contemporanee, incluse le aree più remote e svantaggiate, come le aree interne (Hincapie et al., 2016). Questo concetto si riferisce non solo all'introduzione di nuove tecnologie, ma anche al miglioramento delle tecnologie esistenti, con l'obiettivo di ottimizzare processi, prodotti e servizi (Nasticò er al., 2018). Non si limita alla creazione di nuovi dispositivi o software; essa comprende anche l'implementazione di modalità innovative per l'utilizzo delle tecnologie già esistenti al fine di risolvere problemi complessi e migliorare la qualità della vita, della produttività locale, nonchè delle attività quotidiane di una comunità volta al progresso (Di Bitonto et al., 2010).

Nelle aree interne, come le Madonie, dove le risorse sono spesso limitate e le sfide infrastrutturali significative, l'innovazione tecnologica può svolgere un ruolo cruciale nel superamento di barriere storiche e nella promozione di uno sviluppo sostenibile. Essa consente di affrontare problematiche quali l'isolamento geografico, la carenza di servizi essenziali e la marginalizzazione economica. Attraverso l'adozione di tecnologie avanzate, è possibile migliorare la connettività, agevolare l'accesso ai servizi pubblici e creare nuove opportunità economiche. Le tecnologie avanzate facilitano, infatti, l'accesso a servizi essenziali come la sanità, l'istruzione e la sicurezza, determinando un significativo miglioramento della qualità della vita nelle aree interne. Ad esempio, le tecnologie digitali permettono ai residenti di accedere a servizi sanitari di alta qualità tramite la telemedicina o di partecipare a programmi educativi online, anche di formazione (Hopkins et al., 2017).

L'innovazione tecnologica stimola la crescita economica attraverso la creazione di nuove opportunità di lavoro e il supporto allo sviluppo di imprese locali. Inoltre, promuove la sostenibilità ambientale mediante l'adozione di tecnologie verdi, come le energie rinnovabili, e l'ottimizzazione dell'uso delle risorse naturali, la pratica di nuovi materiali da scarti locali per il recupero del patrimonio costruito (Lombardo et al., 2024).

L'adozione di tecnologie innovative può contribuire a colmare il divario tra aree urbane e rurali, migliorando l'accesso ai servizi e alle opportunità in modo più equo (Trapp et al., 2010). La diffusione di internet ad alta veloci-

tà, ad esempio, può connettere le comunità isolate con il resto del mondo, facilitando il commercio, l'istruzione e la partecipazione civica.

Ha il potenziale di trasformare profondamente le dinamiche sociali e culturali delle comunità, favorendo una maggiore partecipazione e coesione sociale. La digitalizzazione dei servizi pubblici, per esempio, può rendere le amministrazioni locali più trasparenti ed efficienti, rafforzando la fiducia dei cittadini nelle istituzioni.

Nonostante i numerosi benefici, l'innovazione tecnologica presenta anche sfide significative. È fondamentale garantire che le nuove tecnologie siano accessibili a tutti, evitando di generare nuove forme di esclusione, in particolare nei confronti delle generazioni più anziane. Il processo di digitalizzazione, dunque, deve tener conto anche di processi di formazione e predisposizione di tecnologie adeguate per garantire l'accesso nonché il suo uso ai più.

L'innovazione tecnologica rappresenta uno strumento potente per trasformare le aree interne, migliorando la qualità della vita, promuovendo la crescita economica e riducendo le disuguaglianze. Tuttavia, il suo successo dipende da una pianificazione attenta e dall'inclusione delle comunità locali in ogni fase del processo di innovazione.

In primo luogo, il processo formativo risulta fondamentale. L'uso della tecnologia in contesti remoti come questi non è facilmente applicabile, sia per i giovani che per gli anziani (Cho et al., 2023; Tang et al., 2024). Progetti come NONNO Lab[1], Nonni su Internet[2] e Terza Età Online sono solo alcuni degli esempi intrapresi con grande successo in Italia. È inoltre significativo il proliferare di sportelli digitali istituiti nei piccoli comuni, finalizzati a fornire consulenze gratuite per facilitare l'accesso a Internet,, e garantire l'uso dello SPID, un'iniziativa che si sta ora espandendo a macchia d'olio in altri comuni e in altre parti del mondo (Lucan et al., 2024).

Questo processo, basato sull'adozione di strumenti e piattaforme digitali avanzate, ha rivoluzionato la modalità di generazione, elaborazione, distribuzione e utilizzo delle informazioni, influenzando in profondità l'economia, la cultura e il funzionamento delle istituzioni pubbliche e private (Mao et al., 2024).

L'innovazione digitale non si limita alla mera introduzione di nuove tecnologie, ma comporta anche un profondo cambiamento culturale, organizzativo e metodologico. Per sfruttare appieno il potenziale delle tecnologie emergenti, le organizzazioni devono ripensare i propri modelli operativi, rivedere i processi interni e sviluppare nuove competenze. Questo percorso di trasformazione, proposto anche dall'UE[1] in termini di matrice di valutazione e fasi chiave nella trasformazione digitale (*Fig. 1*), richiede un'integrazione coerente e strategica delle tecnologie digitali, affrontando le sfide relative alla sicurezza, alla gestione dei dati e alla sostenibilità (*Fig. 2*).

Nelle piccole comunità, dove spesso i servizi dipendono da centri urbani più grandi, la digitalizzazione delle pratiche amministrative diventa una priorità ineludibile. L'implementazione di sportelli digitali permette di semplificare e velocizzare i processi burocratici, riducendo la distanza tra cittadini e amministrazioni decentrate e diminuendo la dipendenza dalle città maggiori (Mukhsin et al., 2018). Una solida infrastruttura di rete, a partire dalla banda larga, è solo il primo passo. Successivamente, è fondamentale investire nell'uso di database e piattaforme integrate che supportino la gestione e la condivisione sicura dei dati; cloud digitali a supporto e anche la protezione degli stessi.

Questa digitalizzazione non riguarda solo la gestione delle pratiche amministrative, ma ha un impatto diretto sulla qualità dei servizi offerti alla comunità. I dati, infatti, diventano uno strumento prezioso per informare i cittadini in tempo reale, per esempio sulla viabilità o sulle interruzioni stradali (Lombardo, 2022), per promuovere una mobilità consapevole e sicura nelle aree montane, e per incentivare l'uso di mezzi di trasporto pubblici (Stein et al., 2022). In questo modo, l'innovazione digitale contribuisce a co-

[1]Il progetto NONNO LAB, promosso dall'associazione Il Tulipano Bianco A.P.S., offre un corso di formazione digitale per anziani, volto a favorire l'inclusione digitale e a rendere accessibili le tecnologie quotidiane alle persone più anziane. Il programma si concentra su competenze di base, come l'uso di smartphone, tablet e PC, e si articola in dieci lezioni pratiche, ognuna dedicata a un aspetto specifico della tecnologia. Le lezioni coprono argomenti come l'uso del telefono, della messaggistica, di WhatsApp, dei social media, e la protezione da virus e phishing. Il corso è tenuto ogni lunedì da Dario Casani presso il Centro Sociale Anziani Ostiense ex Mercati Generali, e si conclude con un test finale e la consegna di attestati di partecipazione.

[2] Nonni su Internet è un progetto nazionale di alfabetizzazione digitale rivolto a persone over 60, nato con l'obiettivo di diffondere competenze digitali di base tra gli anziani. Attivo da quattordici edizioni, il programma ha formato oltre 30.000 "internauti senior," di cui il 65% donne, grazie al supporto di 21.000 tutor, studenti delle scuole, e 2.100 insegnanti coordinatori. Il progetto ha coinvolto 20 regioni italiane e ha raggiunto anche 11 paesi esteri, proponendo un modello di apprendimento intergenerazionale che favorisce lo scambio di conoscenze tra giovani e anziani.

I corsi si svolgono nelle aule informatiche di scuole di ogni ordine e grado, con classi composte da 20-25 anziani, spesso nonni degli stessi studenti, oppure frequentanti dei centri sociali o di altre associazioni locali. La durata del corso gratuito è di 30 ore, suddivise in 15 incontri settimanali da due ore. A ogni anziano vengono affiancati un tutor e un insegnante esperto in tecnologie, garantendo un rapporto ottimale di un tutor ogni due partecipanti. Alla fine del corso, tutti ricevono un attestato di partecipazione, e le scuole includono il progetto nel Piano dell'Offerta Formativa (Pof), riconoscendo anche crediti formativi agli studenti coinvolti.

Il programma copre le basi dell'uso del computer, dalla navigazione su Internet alla posta elettronica, fino ai social network. Inoltre, introduce i partecipanti all'utilizzo di periferiche come fotocamere e scanner, oltre a dispositivi moderni come smartphone e smart TV, per agevolare la familiarizzazione con le nuove tecnologie di comunicazione. Ogni edizione include la creazione di un progetto multimediale, realizzato insieme da tutor e partecipanti, come un dizionario dei giochi tradizionali o un album fotografico digitale.

Per diffondere ulteriormente le competenze digitali, il progetto mette a disposizione manuali e guide gratuite sul proprio sito, mentre è possibile contattare la Coordinatrice per l'Innovazione nella scuola, Cecilia Stajano, per ulteriori informazioni.

[1] L'European Network for Rural Development, nel testo "Smart Villages and Rural Digital Transformation," individua i passi chiave per la digitalizzazione nelle aree rurali nei Piani Strategici della PAC: mappare il supporto politico esistente, identificare opportunità e necessità attraverso analisi SWOT, e definire

priorità per interventi mirati. Tra questi, investimenti in infrastrutture locali, formazione per ridurre il divario digitale, e cooperazione tramite il programma LEADER per progetti pilota e hub digitali. Infine, stabilire obiettivi, allocare budget e implementare gli interventi necessari.

struire una comunità più efficiente e connessa, rafforzando la partecipazione e la qualità della vita anche nei territori più isolati.

A. The extent and quality of digital resources and skills	Digital infrastructure (incl. WIFI) and public access points	Score (1-5)	Score (1-5)
	The existence of creative, work, innovation and maker spaces/hubs	Score (1-5)	Score (1-5)
	Coordination by a multi-skilled individual/ team (within a wider network)	Score (1-5)	Score (1-5)
	Local & networked experts, skills, technical support & equipment pool	Score (1-5)	Score (1-5)
B. The types of digital functions that the village can carry out	Facilitation of social and economic digital inclusion of local stakeholders	Score (1-5)	Score (1-5)
	Support to digital and social innovation and co-creation in coordination with external policy-makers/service deliverers	Score (1-5)	Score (1-5)
	Mediation/brokerage services to enable the village to access external Research, Technological Development and Innovation (RTDI)	Score (1-5)	Score (1-5)
	Relay for national and regional Digital Innovation Hubs (DIH) and Incubator/Accelerator networks	Score (1-5)	Score (1-5)

Fig. III.1.4.1 | Matrice per valutare la maturità digitale di un villaggio o di un'area rurale ©2024, European Network for Rural Development

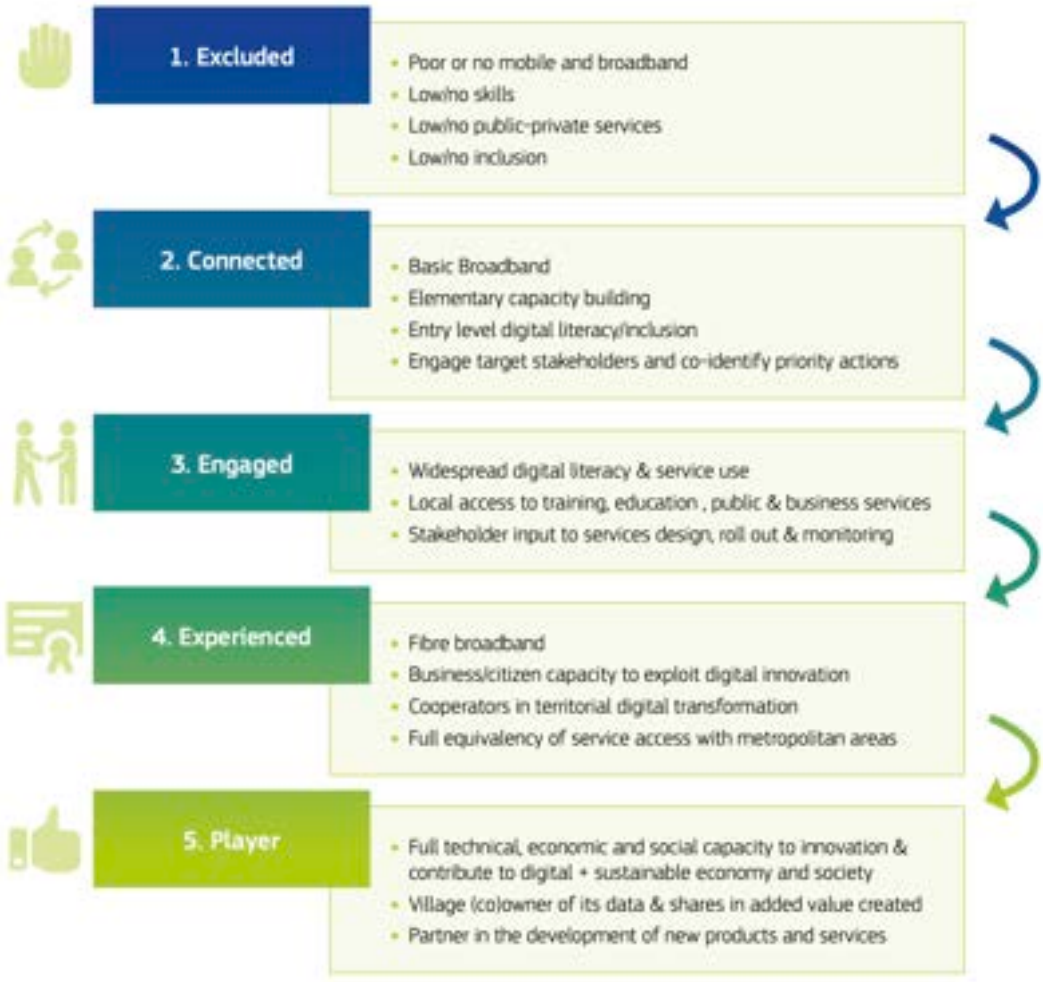


Fig. III.1.4.2 | Fasi chiave nella trasformazione digitale delle aree rurali ©2024, European Network for Rural Development

III.1.4.1 Accessibilità e Design for All

Le zone rurali e montane della Sicilia, come il comprensorio delle Madonie, sono spesso caratterizzate da una complessa morfologia e da vincoli legati alla conservazione del patrimonio storico-architettonico, che rendono la realizzazione di interventi di accessibilità ancora più sfidante. Se nel paragrafo precedente il tema dibattuto è stato l'accessibilità digitale, è altrettanto opportuno valutare anche quella fisica. Garantire l'accesso universale a tecnologie, beni, servizi e infrastrutture è essenziale per promuovere l'inclusione e l'equità territoriale, sostenendo al contempo la valorizzazione di questi territori (Moseley, 1979). Il concetto di "Design for All" si presenta come una filosofia progettuale che abbraccia una visione inclusiva, mirata alla creazione di ambienti, prodotti e servizi utilizzabili da chiunque, indipendentemente dalle proprie capacità fisiche o cognitive fu introdotto dall'architetto Ronald L. Mace nel 1985 per descrivere un processo progettuale che risponda alle esigenze di un'ampia gamma di persone, inclusi coloro che vivono con disabilità (Farrington et al., 2005). Nel corso degli anni, il concetto si è evoluto attraverso vari approcci, quali l'*Inclusive Design* e lo *Human-Centered Design*, fino a giungere al Design for All, come sancito dalla Dichiarazione di Stoccolma del 2004. L'obiettivo di tali approcci è chiaro: progettare per la diversità umana.

Nel 1997, il Centro per l'Universal Design dell'Università del North Carolina ha formalizzato sette principi che guidano la progettazione inclusiva (ESPON, 2019) e che, ancora oggi, devono essere il fulcro di ogni progettazione in fase sia ante che post:

- ***equitable use***: L'utilizzo deve essere equo, permettendo a tutti di accedere alle stesse opportunità senza discriminazioni;
- ***flexibility in use***: La progettazione deve garantire flessibilità, adattandosi alle diverse abilità e preferenze degli utenti;
- ***simple and intuitive***: I prodotti e gli ambienti devono essere semplici e intuitivi nell'uso, senza richiedere istruzioni complesse;
- ***perceptible information***: Le informazioni devono essere trasmesse in modo chiaro, indipendentemente dalle condizioni ambientali o dalle abilità sensoriali dell'utente;
- ***tolerance for error***: La progettazione deve minimizzare i rischi di errore o di utilizzo non idoneo;
- ***low physical effort***: L'utilizzo deve richiedere un basso sforzo fisico.
- ***size and space for approach and use***: Gli spazi devono essere idonei per l'accesso e l'utilizzo da parte di chiunque.

In contesti come quelli delle Madonie, caratterizzati da un elevato valore storico e paesaggistico, l'adozione di questi principi deve essere integrata con il rispetto per il tessuto urbano esistente e con la necessità di preservare l'autenticità dei luoghi. Un progetto inclusivo nelle aree interne siciliane, quindi, non solo deve rispondere ai bisogni della popolazione residente (che spesso include per lo più anziani e persone con disabilità), ma deve farlo tenendo conto delle specificità geografiche e delle preesistenze culturali e soprattutto architettoniche.

L'accessibilità fisica riguarda la progettazione e l'adattamento di spazi pubblici e privati per garantire che possano essere utilizzati da tutti, comprese le persone con disabilità (Farrington et al., 2005). Per migliorare l'accessibilità fisica, è fondamentale implementare soluzioni come rampe e ascensori adeguati, che permettano l'accesso a edifici, strutture e porzioni di aree urbani senza barriere. Le rampe devono essere progettate con una pendenza appropriata, talvolta, anche parzialmente sostituite da piccole scalinate qualora troppo ripide e gli ascensori devono essere spaziosi e facilmente utilizzabili, intragrabili nel contesto urbano anche, a volte, andando contro i canonici principi di decoro urbano.

Proprio per tale motivo, una conoscenza dell'architettura tradizionale e delle tecniche è opportuna per comprendere la tipolgia degli interventi

da attuare in vista delle innumerevoli barriere architettoniche presenti nella tantissime scalinate, cordonate per i vicoli dei paesi dell'entroterra (Lombardo et al. 2023). Tale accessibilità deve essere altresì valutata all'interno degli edifici contribuendo ad una fruibilità degli spazi congrua alle disabilità presenti.

Ad un'accessivilità fisica, corrisponde anche quella visiva. Il design deve essere semplice e intuitivo, assicurando che sia facilmente comprensibile e utilizzabile senza la necessità di istruzioni complicate. Inoltre, l'integrazione di tecnologie assistive è fondamentale per consentire alle persone con disabilità di partecipare appieno alla società. Questi strumenti includono schermi vocali, lettori di schermo e altri ausili che migliorano l'interazione con il mondo digitale e fisico; anche l'utilizzo di font idonei ad una più facile lettura di testi e delle segnaletiche. Infine, è essenziale il coinvolgimento degli utenti nel processo di progettazione.

Inoltre, la segnaletica che sia monumentale o stradale deve essere chiara e ben visibile, con contrasti adeguati e caratteri grandi, e includere anche indicazioni tattili e braille per le persone non vedenti.

La pavimentazione e gli arredi devono essere progettati per garantire la sicurezza e il comfort, oltre che adeguardi ai principi di decoro urbano come previsti da possibili piani del colore o manuali di recupero o linee guida, così come quelle per il Comune di Polizzi Generosa, output della seguente tesi. È importante utilizzare materiali antiscivolo e evitare ostacoli che possano impedire il movimento.

Le esperienze e i feedback delle persone con disabilità forniscono informazioni preziose per affinare e migliorare l'accessibilità.

L'applicazione di questi principi si estende a vari settori, come l'architettura e l'urbanistica, progettando edifici e spazi pubblici con rampe, ascensori e percorsi accessibili. Anche il design industriale e delle interfacce utente beneficia di questi principi, con prodotti e servizi progettati per essere utilizzabili da un'ampia gamma di persone, non ultimo considerare l'*user experience* che deve essere in ogni modo garantita.

Anche la progettazione degli spazi verdi dovrebbe tenere conto dell'accessibilità, includendo percorsi e attrezzature fruibili da tutti, come panchine e tavoli regolabili, nonchè zone d'ombra per le estati, talvolta, troppo calde e afose o ripari per inverni troppo rigidi.

L'accessibilità digitale già ampiamenta trattata nel paragrafo precedente deve essere integrata a quella fisica così come è stato fatto per i totem per il Comune di Polizzi Generosa[1], elaborata con la grande sinergia di CoopCulture (vedi *Fig. 1*), ha concesso, tramite l'apposizione di un QrCode, una piattaforma *smart* al Comune in grado di farsi conoscere online, ma anche di ampliare l'offerta culturale del territorio.

L'iniziativa è volta alla fruizione fisica e digitale, o per meglio dire, innovativa del patrimonio digitale. Totem in corten che valorizzano il patrimonio e si integrano perfettamente con il contesto locale che rispettano, oltretutto, ogni tipo di disabilità sia visiva che fisica permettendo la loro fruizione anche in carrozzina o anche in assenza di una potenzialità visiva alta.

La sensibilizzazione e la formazione in questa fase sono cruciali per promuovere una cultura dell'inclusione e garantire che le pratiche di progettazione rispettino i principi di accessibilità (Mikou, 2019). Programmi di formazione dedicati a progettisti, architetti, amministratori pubblici e cittadini aiutano a diffondere la conoscenza e le competenze necessarie per implementare il design universale. Campagne di sensibilizzazione pubbliche possono educare il pubblico sull'importanza dell'accessibilità e sui benefici che essa apporta a tutta la comunità.

È anche utile collaborare con associazioni che rappresentano persone con disabilità, per ottenere *feedback* e suggerimenti che possano migliorare le pratiche di progettazione e inclusione.

Le normative sull'accessibilità forniscono le linee guida e i requisiti legali per garantire che edifici, spazi pubblici e tecnologie siano accessibili a tutti. In Italia, la Legge 104/1992 stabilisce i principi fondamentali per l'assistenza e

[1] Visit Polizzi Generosa. (n.d.). Visit Polizzi Generosa. https://visitpolizzigenerosa.it/it/ [Ultimo accesso 14 settembre 2024]

l'inclusione delle persone con disabilità, mentre la Legge 246/2005 definisce requisiti specifici per l'accessibilità di spazi e strutture. A livello europeo, la Direttiva 2016/2102 stabilisce standard per l'accessibilità dei siti web e delle applicazioni mobili degli enti pubblici.

Per garantire la conformità a queste normative, è importante mantenere le normative aggiornate per riflettere le nuove tecnologie e le esigenze emergenti. Implementare queste pratiche non solo migliora la qualità della vita delle persone con disabilità, ma arricchisce la società nel suo complesso, promuovendo l'inclusione e l'uguaglianza.

Fig. III.1.4.1.1 | Vicoli di Petralia Sottana ©Luisa Lombardo, 2024

LEGENDA:

1 Chiesa del SS. Crocifisso
2 ruderi chiesa Madonna del Castello
3 ex Chiesa S. Francesco/ Auditorium comunale
4 Chiesa dell'Annunziata
5 Chiesa di S. Margherita o Badia Vecchia
6 Chiesa di S. Nicolò de Pranchis
7 Chiesa della Madonna delle Grazie o Badia Nuova
8 Chiesa di S. Gandolfo la Povera e Collegio di Maria
9 Chiesa Maria SS. Assunta
10 Palazzo Gagliardo
11 Chiesa di S. Girolamo
12 ex Collegio dei Gesuiti o Palazzo della cultura
13 Chiesa di S. Caterina o Battuto
14 Palazzo Carpinelli
15 Palazzo Caruso
16 Chiesa di S. Oreste
17 Chiesa della Madonna degli Schiavi
18 Chiesa di S. Antonio Abate
19 Chiesa di S. Mario Lo Piano
20 Chiesa dell'Urbenica
21 Chiesa di S. Panoxuzo e Torre di Leo
22 Commenda

posizionamento segnaletica esistente

Area sprovvista di segn
23 convento dei padri
chiesa Santa Spera

ALCUNI PARTICOLARI ESEMPLIFICATIVI: STATO DI FATTO E STATO DI PROGETTO

1 Chiesa di San Francesco, segnaletica obsoleta,alta e su scalini

2 ruderi Chiesa Madonna del castello, segnaletica alta

13 Chiesa di Santa Caterina: segnaletica obsoleta e collocata in posto limitato dal traffico e a ridosso di decorazione architettonica

ESEMPIO DI GRAFICA, STATO DI FATTO

7 Chiesa Madonna delle Grazie o Badia Nuova

7 Chiesa Madonna delle Grazie o Badia Nuova

7 stato di fatto, con segnaletica obsoleta e troppo vicina al bugnato

7 progetto e ricollocamento

16 Chiesa di Sant'Oreste: segnaletica obsoleta e troppo vicina al portale

16 stato di fatto, con segnaletica obsoleta e troppo vicina al bugnato

16 progetto e ricollocamento

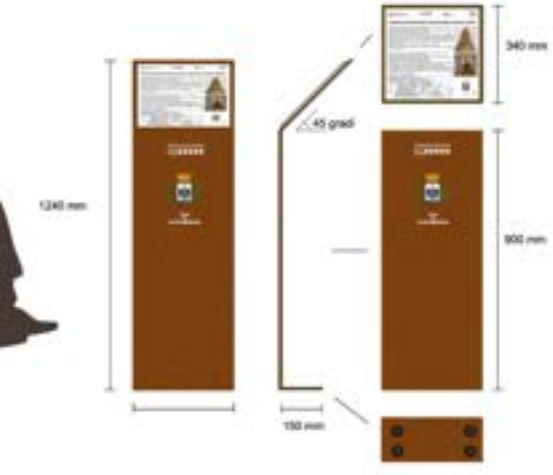
aletica monumentale e con intenzione di integrare
Domenicani, Oratorio del SS.Rosario e
o (tutti tre ruderi parzialmente demoliti)

ESEMPIO DI GRAFICA, PROGETTO

) Chiesa Madonna delle Grazie o Badia Nuova

i resti Chiesa dei padri Domenicani, Oratorio del SS. Rosario e Chiesa del Santo Spirito: progetto di integrazione segnaletica

PARTICOLARE DEL TOTEM ILLUSTRATIVO



PARTICOLARE DI INTERVENTO DI AREA SPROVVISTA DI SEGNALETICA

i resti Chiesa dei padri Domenicani, Oratorio del SS. Rosario e Chiesa del Santo Spirito, scelta di tutto

III.2 Strumenti per la gestione di Smart Villages

Nello sviluppo di *Smart Villages* nelle aree rurali delle Madonie, ma anche in altri contesti, per analogia o per contrasto, occorre seguire un percorso strutturato, partendo da elementi strategici fino a quelli operativi. Tra gli aspetti da tenere in considerazione vi è la definizione degli attori principali: *governance*, comunità, salvaguardia del patrimonio e implementazione delle tecnologie digitali come già visto nei paragrafi precedenti. Questi attori, tuttavia, hanno bisogno di un preciso processo da seguire articolato in diverse fasi che comprendono linee guida (Mańkowska et al. 2024), la base strategica da cui partire, seguite da *best practices*, *business plan* e infine da protocolli di gestione. Nel dettaglio:

- **linee guida:** forniscono una cornice di principi generali e orientamenti strategici, in grado di indirizzare il progetto verso un approccio digitale e sostenibile, adeguato alle peculiarità territoriali e alle necessità delle comunità delle Madonie.
- ***best practices*:** seguono immediatamente le linee guida come modelli operativi comprovati e replicabili, che offrono soluzioni concrete ispirate a esperienze già applicate con successo. Aiutano a tradurre i principi generali in esempi pratici che possono essere adattati localmente.
- ***business plan*:** il piano economico e finanziario del progetto. Basato sulle linee guida e sulle best practices, dettaglia la sostenibilità economica e i piani di investimento necessari, assicurando che le risorse siano allocate in modo efficiente per sostenere gli obiettivi del progetto nel lungo termine.
- **protocollo di gestione:** raccoglie procedure operative, ruoli e responsabilità per ciascuna fase del progetto. Guida l'esecuzione concreta delle azioni, curando gli aspetti di *governance*, integrazione con la comunità, salvaguardia del patrimonio e implementazione delle tecnologie digitali.

Ogni elemento costruisce un sistema di supporto necessario per il successivo, assicurando che il progetto si sviluppi con una base strategica solida, modelli operativi collaudati, un piano finanziario ben definito e un framework di gestione efficace.

Fig. III.2.1 | Quattro step per il raggiungimento dello Smart Villages ©Luisa Lombardo, 2024

Oltre ad un approccio meramente tecnologico è opportuno valutare ex ante la fattibilità degli interventi procedendo per ordine ad una sistematica organizzazione delle attività da intraprendere

III.2.1 Linee Guida e Best Practices

Alla luce dell'analisi condotta finora, si è ritenuto opportuno analizzare le mappe tematiche "di rete" elaborate per l'Atlante al fine di comprendere la situazione attuale delle Madonie, quali comuni, rispetto alle varie tematiche esplorate sino ad ora sono considerabili virtuosi in termini di progettualita, nonché per valutare come sia possibile rivalutare le iniziative promuovendo la partecipazione attiva delle realtà rimaste estranee (Letaifa, 2015). Tali mappe (consultabili all'interno dell'Atlante per le soluzioni tecnologiche per il comprensorio Madonita) considerano il numero totale di comuni appartenenti alle aree Alte, Basse e Madonie Imeresi, unitamente ai comuni recentemente affiliati al GAL, come delineato nel Capitolo II, e cercano di delineare il percorso intrapreso dai comuni in questi anni per il raggingimento di progetti volti alla formazione di SV (Stoustrup, 2021).

Alla luce delle analisi effettuate si è evinto come il comparto madonita non sia ancora dotato di comuni capaci di esplorare e avanzare l'idea dello *Smart Village*, tuttavia, ancora tanta è la strada da percorrere e alcuni parametri si ritengono necessari al fine di contribuire ad una rete di Villaggi *Smart* nelle Madonie. Pertanto, seguire degli *iter* specifici risulta necessario per una gestione condivisa delle risorse e per lo sviluppo di strategie (Zavratnik et al., 2018) e progettualità sinergiche, questo risulta possibile attraverso le linee guida e le best practices (European Parliament, 2005).

Di seguito l'elenco delle azioni da intraprendere all'interno del Parco delle Madonie e nei suoi 21 comuni afferenti al fine di creare *Smart Villages*, si rende noto che, a partire dalle linee guida (European Union, 2023), derivano le conseguenti best pratices, ovvero in che modo queste devono essere declinate rispetto al tema centrale:

<u>Integrazione comunitaria e partecipazione attiva</u>

Coinvolgere i cittadini nelle decisioni e nella gestione dei beni culturali per favorire una comunità consapevole e responsabile.

Best practices:

- creare gruppi di lavoro e piattaforme di ascolto per raccogliere proposte e feedback dei cittadini;
- organizzare sessioni di *co-design*, *workshop* e *focus group* per incoraggiare la partecipazione attiva e costruire soluzioni condivise;
- promuovere iniziative di associazionismo e cooperazione comunitaria, incentivando la creazione di cooperative locali per la gestione di servizi e patrimonio.

<u>Governance inclusiva e trasparente</u>

Implementare una *governance* che sia trasparente e in grado di rispondere alle esigenze della comunità, con politiche chiare per la tutela e la valorizzazione del patrimonio.

Best practices:

- sviluppare un piano strategico che integri conservazione, innovazione e sostenibilità, e che sia accessibile a tutti i cittadini;
- facilitare partenariati pubblico-privato per attrarre risorse e competenze, sostenendo iniziative culturali e di tutela del patrimonio;
- stabilire indicatori di monitoraggio per valutare periodicamente l'impatto delle iniziative di tutela e apportare miglioramenti in base ai risultati ottenuti;
- integrare strumenti per la gestione del patrimonio.

<u>Implementazione della tecnologia e digitalizzazione</u>

Utilizzare strumenti tecnologici per migliorare l'accesso alle informazioni, la comunicazione e la conservazione del patrimonio, nonché per ottimizzare i servizi locali.

Best practices:

- digitalizzare i beni culturali e creare una piattaforma online che consenta sia ai cittadini che ai turisti di esplorare il patrimonio culturale e

naturale del villaggio;
- utilizzare sensori e tecnologie di monitoraggio per la manutenzione predittiva dei beni storici, prevenendo danni e preservando i materiali e le strutture originali;
- creare app o portali di partecipazione digitale per coinvolgere la comunità nelle decisioni e raccogliere segnalazioni o suggerimenti sulle iniziative in corso.

Valorizzazione del patrimonio materiale e immateriale
Salvaguardare le risorse materiali e immateriali del villaggio e promuoverle come risorsa culturale e turistica.
Best practices:
- realizzare interventi di recupero e manutenzione che rispettino le tecniche costruttive tradizionali e i materiali locali, preservando l'autenticità e il valore storico dei beni;
- organizzare festival, mostre e percorsi culturali che evidenzino le tradizioni e le competenze locali, coinvolgendo artigiani, artisti e comunità;
- sostenere la trasmissione delle conoscenze tradizionali e del know-how locale, offrendo corsi e laboratori per educare le nuove generazioni e i visitatori.

Sostenibilità e economia circolare
Adottare un modello di economia circolare per promuovere la sostenibilità ambientale e la riduzione degli sprechi, incoraggiando il riciclo e il riuso nelle attività locali.
Best practices:
- incentivare le imprese locali a utilizzare risorse rinnovabili e a creare prodotti con materiali sostenibili;
- organizzare campagne di sensibilizzazione sull'importanza della sostenibilità e della gestione circolare e responsabile delle risorse.

Accessibilità e inclusione
Garantire che le iniziative e i luoghi di interesse siano accessibili a tutti, indipendentemente dalle abilità fisiche o dal background culturale.
Best practices:
- assicurarsi che i percorsi culturali, gli edifici e le informazioni digitali siano accessibili e prevedere adeguamenti strutturali dei luoghi per l'inclusione.

Lo sviluppo di *Smart Villages* richiede, dunque, un approccio olistico e collaborativo. Le linee guida e le best practices delineate sopra sono fondamentali per garantire che tali progetti siano sostenibili, inclusivi e in grado di migliorare la qualità della vita nelle comunità rurali e implementare proposte e progetti per e con la comunità. L'innovazione tecnologica, quando guidata da un impegno comunitario e da una visione a lungo termine, può trasformare i villaggi in centri di prosperità e benessere.

Questi sono dunque riferimenti fondamentali e necessari per orientare la progettazione e la gestione degli *Smart Villages*; documenti normativi che forniscono indicazioni su come affrontare specifici aspetti della gestione e dello sviluppo di questi villaggi, offrendo un quadro metodologico e operativo. Le best practices, d'altra parte, rappresentano le strategie e le soluzioni più efficaci, sviluppate sulla base di esperienze positive e successi concreti. Questi strumenti sono essenziali per garantire che i progetti siano allineati agli standard più elevati e rispondano alle esigenze locali in modo efficiente e sostenibile.

III.2.1.1 Settori di applicazione
Le linee guida e le buone pratiche identificate sono utili per sviluppare processi di gestione e organizzazione degli *Smart Villages* e trovano ispirazione sia dall'Atlante elaborato che dai bisogni concretamente rilevati sul territo-

rio. Ogni settore di applicazione richiede un approccio mirato per garantire risultati ottimali, tenendo conto anche dei principi dell'Agenda 2030 per lo sviluppo sostenibile. Proprio per tale motivo le Linee Guida si rifanno alle 12 categorie dell'Atlante elaborato, toccando anche ulteriori ambiti a volte anche intersecati tra loro per contribuire allo sviluppo dell'area madonita in chiave sostenibile e *green*. Tra i principali ambiti di intervento si annoverano la gestione delle infrastrutture tecnologiche, la sostenibilità ambientale, lo sviluppo economico e sociale, e la sicurezza e la salute pubblica.

A titolo d'esempio, possono riguardare le infrastrutture tecnologiche, includere la progettazione di reti di connettività e l'integrazione di dispositivi IoT per agevolare la gestione del territorio, nonché monitorare e prevedere interventi di manutenzione. Tali linee guida possono anche promuovere l'adozione di energie rinnovabili e pratiche avanzate di gestione dei rifiuti. In ambito economico e sociale, l'attenzione si concentra anche sul coinvolgimento attivo della comunità e sulla promozione di iniziative legate al turismo sostenibile. Nel contesto della sicurezza e della salute pubblica, possono prevedere l'introduzione di sistemi di telemedicina e strumenti per il monitoraggio della qualità dell'aria, contribuendo così al benessere della popolazione.

III.2.1.2 Scopi e benefici

Gli scopi principali sono garantire una gestione efficace ed efficiente del territorio, promuovendo un approccio integrato che unisca innovazione tecnologica, sostenibilità ambientale e partecipazione comunitaria. I benefici includono la definizione di standard di qualità e procedure operative che incoraggiano l'adozione di tecnologie avanzate e strategie coerenti con i principi dello sviluppo sostenibile. Comprendono il miglioramento dell'organizzazione territoriale, l'ottimizzazione delle risorse disponibili e la promozione di una *governance* inclusiva e partecipativa.

Tra i benefici principali si annoverano il miglioramento della qualità della vita e della coerenza dei servizi erogati, consentendo una gestione più trasparente e accessibile per tutti gli abitanti. L'adozione di soluzioni ottimizzate riduce significativamente i costi operativi, liberando risorse per ulteriori investimenti strategici. L'aumento della sostenibilità ambientale, ottenuto attraverso pratiche innovative e a basso impatto, contribuisce alla tutela del territorio e al miglioramento della qualità della vita.

Un ulteriore beneficio è rappresentato dal rafforzamento della coesione sociale, grazie a processi che promuovono l'inclusione e la partecipazione attiva della comunità locale. Questo coinvolgimento non solo valorizza il ruolo degli abitanti, ma stimola anche la creazione di nuove opportunità economiche e sociali, consolidando il senso di appartenenza al territorio. La standardizzazione delle pratiche agevola la replicabilità di modelli virtuosi, consentendo la diffusione di esperienze di successo in altri contesti, con un impatto positivo su scala più ampia.

III.2.1.3 Sviluppo e implementazione

Il loro sviluppo e implementazione si basano su un processo articolato e sistematico, che tiene conto delle peculiarità del territorio e delle sfide specifiche da affrontare. La prima fase consiste in un'analisi dettagliata delle esigenze locali, volta a identificare priorità, criticità e opportunità. Questo studio preliminare consente di delineare un quadro chiaro e contestualizzato, indispensabile per sviluppare linee guida e pratiche operative che siano effettivamente rispondenti ai bisogni rilevati.

La loro redazione delle linee guida rappresenta il passo successivo ed è caratterizzata dall'elaborazione di raccomandazioni basate sull'analisi svolta. Queste raccomandazioni includono soluzioni tecniche e operative innovative, che riflettono i principi di sostenibilità, efficienza e inclusività. L'obiettivo è definire strumenti pratici e strategie applicabili, in grado di ottimizzare la gestione delle risorse e favorire lo sviluppo locale.

L'implementazione richiede un coinvolgimento attivo degli *stakeholder*

attraverso percorsi di formazione mirati, pensati per garantire una comprensione approfondita delle pratiche suggerite. Parallelamente, l'adozione delle linee guida deve essere supportata da un sistema di monitoraggio continuo, che consente di verificare i progressi raggiunti, identificare eventuali criticità e introdurre modifiche o aggiustamenti laddove necessario.

Un elemento cruciale è il meccanismo di feedback e revisione periodica, che assicura la costante attualità e rilevanza e potenziale modifica o ottimizzazione delle linee guida nel tempo. Questo approccio iterativo permette di rispondere prontamente a nuovi bisogni o a cambiamenti nel contesto, garantendo così una gestione flessibile e orientata al miglioramento continuo.

III.2.1.4 Ruolo nell'innovazione e nel cambiamento

Le linee guida e le buone pratiche rivestono un ruolo determinante nel promuovere innovazione e cambiamento dei territori per il raggiungimento all'interno degli *Smart Villages*, fungendo da catalizzatori per lo sviluppo di soluzioni avanzate e sostenibili. Una base strutturata e affidabile facilita l'introduzione di tecnologie emergenti e l'integrazione di metodologie innovative, accrescendo la capacità delle comunità locali di adattarsi ai cambiamenti e alle sfide del futuro.

Grazie alla promozione di tecnologie avanzate e all'adozione di strategie orientate all'innovazione, le linee guida favoriscono la modernizzazione delle infrastrutture e dei servizi, stimolando una trasformazione profonda delle comunità rurali. Questo processo contribuisce a renderle modelli di sviluppo sostenibile, capaci di coniugare tradizione e progresso in un equilibrio virtuoso.

Le buone pratiche agevolano il cambiamento attraverso la standardizzazione e la condivisione di soluzioni efficaci, creando un contesto propizio alla sperimentazione e alla diffusione di nuove idee. Tale approccio incentiva un ciclo continuo di miglioramento, incoraggiando non solo l'applicazione di tecnologie innovative, ma anche lo sviluppo di strategie collaborative e partecipative, che rafforzano la resilienza e la competitività delle comunità rurali.

Fig. III.2.1.4.1 | Studenti in cerca di idee per il recupero e la valorizzazion del trittico fiammingo di Polizzi Generosa ©Luisa Lombardo, 2024

INTEGRAZIONE COMUNITARIA E PARTECIPAZIONE ATTIVA

Coinvolgere i cittadini nelle decisioni e nella gestione dei beni culturali per favorire una comunità consapevole e responsabile:

- Creare gruppi di lavoro e piattaforme di ascolto per raccogliere proposte e feedback dei cittadini.
- Organizzare sessioni di co-design e workshop per incoraggiare la partecipazione attiva e costruire soluzioni condivise.
- Promuovere iniziative di associazionismo e cooperazione comunitaria, incentivando la creazione di cooperative locali per la gestione di servizi e patrimonio.

GOVERNANCE INCLUSIVA E TRASPARENTE

Implementare una governance che sia trasparente e in grado di rispondere alle esigenze della comunità, con politiche chiare per la tutela e la valorizzazione del patrimonio.

- Sviluppare un piano strategico che integri conservazione, innovazione e sostenibilità, e che sia accessibile a tutti i cittadini.
- Facilitare partenariati pubblico-privato per attrarre risorse e competenze, sostenendo iniziative culturali e di tutela del patrimonio.

Stabilire indicatori di monitoraggio per valutare periodicamente l'impatto delle iniziative di tutela e apportare miglioramenti in base ai risultati ottenuti.

IMPLEMENTAZIONE DELLA TECNOLOGIA E DIGITALIZZAZIONE

Utilizzare strumenti tecnologici per migliorare l'accesso alle informazioni, la comunicazione e la conservazione del patrimonio, nonché per ottimizzare i servizi locali.

- Digitalizzare i beni culturali e creare una piattaforma online che consenta sia ai cittadini che ai turisti di esplorare il patrimonio culturale e naturale del villaggio.
- Utilizzare sensori e tecnologie di monitoraggio per la manutenzione predittiva dei beni storici, prevenendo danni e preservando i materiali e le strutture originali.
- Creare app o portali di partecipazione digitale per coinvolgere la comunità nelle decisioni e raccogliere segnalazioni o suggerimenti sulle iniziative in corso.

VALORIZZAZIONE DEL PATRIMONIO MATERIALE E IMMATERIALE

Salvaguardare le risorse materiali e immateriali del villaggio e promuoverle come risorsa culturale e turistica.

- Realizzare interventi di restauro e manutenzione che rispettino le tecniche tradizionali e i materiali locali, preservando l'autenticità e il valore storico dei beni.
- Organizzare festival, mostre e percorsi culturali che evidenzino le tradizioni e le competenze locali, coinvolgendo artigiani, artisti e comunità.
- Sostenere la trasmissione delle conoscenze tradizionali e del know-how locale, offrendo corsi e laboratori per educare le nuove generazioni e i visitatori.

SOSTENIBILITÀ E ECONOMIA CIRCOLARE

Adottare un modello di economia circolare per promuovere la sostenibilità ambientale e la riduzione degli sprechi, incoraggiando il riciclo e il riuso nelle attività locali.

- Incentivare le imprese locali a utilizzare risorse rinnovabili e a creare prodotti con materiali sostenibili.
- Organizzare campagne di sensibilizzazione sull'importanza della sostenibilità e della gestione responsabile delle risorse.

ACCESSIBILITÀ E INCLUSIONE

Garantire che le iniziative e i luoghi di interesse siano accessibili a tutti, indipendentemente dalle abilità fisiche o dal background culturale.

- Assicurarsi che i percorsi culturali e le informazioni digitali siano disponibili in formato accessibile e prevedere adattamenti strutturali nei luoghi storici per l'inclusione.

Fig. III.2.1.4.2 | Metodologia implementazione di Linee Guida e Best Practices per lo sviluppo di Smart Villages ©Luisa Lombardo, 2024

Parametri metodologici da tenere in considerazione per uno sviluppo del Business Plan capace di promuovere lo sviluppo di villaggi intelligenti.

III.2.2 Business Plan e Protocolli di gestione degli Smart Villages

La gestione efficace di uno *Smart Village* richiede la creazione di protocolli di gestione ben strutturati e business plan strategici (Goyal et al., 2017). I protocolli di gestione stabiliscono le norme necessarie per implementare e mantenere soluzioni tecnologiche intelligenti e sostenibili, mentre il business plan fornisce una visione strategica e operativa per garantire la sostenibilità economica e il successo a lungo termine delle soluzioni da intraprendere. Questa sezione esplorerà gli elementi chiave dei protocolli di gestione e dei business plan, e discuterà le fasi di implementazione e monitoraggio, evidenziando l'importanza di un approccio integrato per garantire il successo degli *Smart Villages*.

III.2.2.1 Elementi chiave dei Business Plan

Nell'ambito dello sviluppo sostenibile dei centri minori delle Madonie, i business plan assumono un ruolo strategico cruciale per tradurre visioni e strategie in azioni concrete e misurabili. Gli elementi chiave di un business plan per uno *Smart Village* si articolano su più livelli interconnessi, che rispondono alle peculiarità del territorio madonita oggetto di studio.

Un primo elemento fondamentale è la valorizzazione del patrimonio culturale e naturale, che nelle Madonie comprende un ricco ventaglio di risorse tutelate, dai centri storici alle tradizioni artigianali e gastronomiche, fino agli ecosistemi unici del Parco delle Madonie. Questi patrimoni rappresentano il cuore pulsante del progetto e la base su cui costruire iniziative che attraggano sia residenti che turisti.

Un secondo elemento è il coinvolgimento della comunità locale, necessario per garantire il successo del progetto e promuovere una *governance* partecipativa. La comunità diventa un attore centrale nella gestione e nella promozione del territorio, attraverso cooperative, associazioni, e processi di co-progettazione.

La digitalizzazione e l'innovazione tecnologica costituiscono un altro pilastro. La trasformazione digitale nelle Madonie può significare la creazione di archivi digitali del patrimonio culturale, l'uso di applicazioni per il turismo e la gestione dei servizi pubblici, e l'implementazione di sensori IoT per monitorare il patrimonio naturale e architettonico (Morris et al., 2005).

Infine, l'analisi finanziaria e il piano di sostenibilità economica completano il business plan. Considerando la natura prevalentemente fragile del tessuto economico locale, è essenziale individuare risorse diversificate, dai fondi europei per lo sviluppo rurale ai contributi privati possibili, fino alla creazione di entrate generate dal turismo e dalle cooperative locali e da ulteriori iniziative da avviare.

III.2.2.2 Struttura del Business Plan per lo Smart Village

Il business plan rappresenta uno strumento fondamentale per pianificare, organizzare e valutare la sostenibilità di un progetto (Paiola et al., 2024). Tuttavia, quando applicato al contesto degli *Smart Villages*, esso assume caratteristiche particolari che lo distinguono dal modello classico, pur mantenendo alcune analogie di fondo. Entrambi condividono una struttura generale articolata in sezioni chiave come la sintesi del progetto, l'analisi del contesto, la strategia operativa e la pianificazione finanziaria. L'obiettivo principale è definire un percorso chiaro che permetta di raggiungere i risultati prefissati ottimizzando le risorse disponibili e massimizzando i benefici per gli *stakeholder*. Allo stesso modo, entrambi richiedono un'accurata analisi del contesto per identificare opportunità e criticità, nonché una valutazione dettagliata della fattibilità economica. Inoltre, in entrambi i casi, il successo dipende dalla capacità di costruire *partnership* strategiche, che nel caso degli *Smart Villages* includono spesso attori locali, enti pubblici e organizzazioni non governative (Muller et al., 2015).

Ciò che differenzia in maniera sostanziale un business plan classico da uno sviluppato per gli *Smart Villages* è il contesto in cui si applica e le finalità che persegue. Nel modello tradizionale, l'attenzione è spesso rivolta a

settori urbani o aziendali, caratterizzati da elevata densità competitiva e dalla ricerca di profitti finanziari immediati. Nei villaggi rurali, invece, il business plan assume una dimensione più ampia, in cui gli obiettivi economici si intrecciano con finalità sociali e ambientali. Il *focus* principale non è solo la crescita economica, ma anche il contrasto allo spopolamento, la coesione sociale e la valorizzazione del patrimonio culturale e naturale. Di conseguenza, il target cambia: mentre il business plan classico si rivolge principalmente a investitori privati e clienti, quello per gli *Smart Villages* coinvolge comunità locali, enti pubblici e turisti, cercando di rispondere alle esigenze collettive attraverso un modello di sviluppo inclusivo e sostenibile (Rosati et al., 2016).

Un altro elemento distintivo è rappresentato dai fattori chiave di successo. Nel business plan classico, l'attenzione è spesso rivolta all'innovazione del prodotto o del servizio, alla competitività e all'efficienza operativa. Nel caso degli *Smart Villages*, invece, il successo dipende dalla capacità di coinvolgere la comunità locale, dalla protezione e valorizzazione del patrimonio, dall'utilizzo appropriato delle tecnologie e dalla creazione di una *governance* partecipativa. La tecnologia, che nel modello tradizionale è utilizzata prevalentemente per innovare prodotti e servizi, diventa uno strumento fondamentale per migliorare la qualità della vita nelle aree rurali. Iniziative come la digitalizzazione del patrimonio, il monitoraggio ambientale o la creazione di piattaforme per la partecipazione attiva dei cittadini rappresentano esempi concreti di questo approccio.

Anche il modello economico differisce sensibilmente. Se il business plan classico si basa su economie di scala e sulla massimizzazione del ritorno sull'investimento, quello per gli *Smart Villages* integra modelli economici misti, in cui l'economia circolare, il turismo esperienziale e la cooperazione comunitaria giocano un ruolo centrale. Questo riflette la natura dei progetti rurali, che spesso cercano di bilanciare gli aspetti economici con quelli sociali, mirando a generare un impatto positivo sulla qualità della vita delle persone e sull'ambiente.

Infine, cambia la valutazione dell'impatto. Nel modello classico, il successo è misurato prevalentemente in termini di profitto e crescita del mercato, mentre nel contesto degli *Smart Villages* la valutazione è olistica. Gli indicatori economici si affiancano a metriche sociali, come il livello di coesione comunitaria o la capacità di contrastare lo spopolamento, e ambientali, come la preservazione del paesaggio e la riduzione dell'impatto ecologico. Questo approccio riflette un cambiamento di paradigma, in cui lo sviluppo non è visto solo come un processo economico, ma come un equilibrio tra crescita, sostenibilità e valorizzazione delle risorse locali.

Il business plan per uno *Smart Village* nelle Madonie è strutturato in modo da riflettere le specificità del territorio, ma al contempo promuovere un modello replicabile per altre aree interne per analogia o per contrasto.

Si propone, pertanto, la seguenta struttura da tener conto:

<u>Executive Summary</u>

Una sintesi che evidenzia il ruolo dello *Smart Village* come motore di sviluppo per le Madonie, sottolineando i benefici per i residenti e il potenziale turistico e culturale. Ad esempio, potrebbe essere presentato come un "laboratorio diffuso" per la sperimentazione di nuovi modelli di *governance* e sostenibilità.

<u>Descrizione del Progetto</u>

Il progetto proposto deve valorizzare i centri minori madoniti, con interventi che spaziano dal recupero del patrimonio architettonico alla creazione di percorsi tematici legati alla biodiversità e alla storia locale, passando per l'adozione di tecnologie che migliorino l'accessibilità e i servizi pubblici contestualizzati nell'Agenda 2030 o verso nuovi obiettivi che l'Europa intende promuovere.

<u>Analisi di Mercato</u>

Lo studio del target di riferimento include lo studio del flusso turistico alla ricerca di esperienze autentiche, giovani imprenditori interessati al potenzia-

le delle aree interne, e residenti che aspirano a un miglioramento della qualità della vita. Le tendenze di settore evidenziano una crescente domanda per il turismo sostenibile e il ritorno ai centri minori, sostenuta da politiche nazionali ed europee.

Strategia operativa

Il piano deve prevedere attività integrate, come ad esempio:

- la digitalizzazione del patrimonio storico, con tour virtuali e applicazioni interattive;
- l'organizzazione di festival culturali che esaltino tradizioni e sapori locali;
- la formazione di cooperative per la gestione di servizi sociali, economici, turistici e culturali;

Strategia di marketing

- una campagna territoriale potrebbe puntare sul concetto di "Madonie 4.0" o Madonie del futuro, posizionando i centri come destinazioni all'avanguardia, capaci di combinare autenticità e innovazione per una visione a lungo termine.

Fonti di finanziamento

- il piano include un mix di risorse pubbliche e private. Tra le fonti principali si possono citare i fondi europei per la transizione digitale, i programmi nazionali per le aree interne, e *partnership* con aziende interessate a investire in progetti *green* e innovativi.

Analisi finanziaria

- analizzare le eventuali voci di costo considerate o da considerare e il costo annuale della soluzione.

Valutazione e monitoraggio

L'utilizzo di indicatori come il numero di fruitori, il coinvolgimento della comunità, e l'impatto economico diretto permetterà di misurare i progressi e adattare le strategie in corso d'opera.

III.2.2.3 Fase di Implementazione del Progetto

- Pianificazione e coordinamento

La fase di implementazione inizia con un'attenta pianificazione operativa che definisce obiettivi chiari, tempi, risorse e responsabilità. Una volta delineato il piano strategico nel business plan, è necessario tradurre le linee guida in azioni concrete. Un elemento chiave di questa fase è la coordinazione tra tutti gli attori coinvolti: amministrazioni locali, comunità, imprese private, enti pubblici e altre organizzazioni. Ogni partner coinvolto deve avere un ruolo preciso, e il processo decisionale deve essere chiaro, trasparente e partecipativo.

- Sviluppo compatibile delle infrastrutture e tecnologie

Una parte fondamentale dell'implementazione riguarda la creazione delle infrastrutture tecnologiche. La connessione digitale, le soluzioni di *smart governance* (ad esempio, piattaforme per il coinvolgimento dei cittadini) e le tecnologie per la gestione delle risorse naturali (come ad esempio i sensori per monitorare l'ambiente) sono solo alcune delle aree che richiedono attenzione. L'obiettivo è che la tecnologia migliori la qualità della vita, senza alterare il patrimonio e la cultura locali, ma anzi supportandone la valorizzazione.

- Formazione e inclusione della comunità

Un altro aspetto cruciale dell'implementazione riguarda la formazione della comunità locale. Gli abitanti devono essere preparati a utilizzare le nuove tecnologie e coinvolti attivamente nelle decisioni di gestione del villaggio. Ciò non solo facilita l'accettazione del progetto, ma crea anche un forte senso di appartenenza e di responsabilità.

III.2.2.4 Fase di Monitoraggio del Progetto

- Definizione degli indicatori di successo

Il monitoraggio deve partire dalla definizione di indicatori chiari che misurano l'impatto e l'efficacia delle azioni implementate. Questi indicatori

devono essere specifici, misurabili e legati agli obiettivi iniziali del progetto. Alcuni esempi di indicatori includono il miglioramento dell'accesso ai servizi digitali, il livello di partecipazione della comunità, e l'efficienza nella gestione delle risorse naturali.

- **Strumenti di monitoraggio e raccolta dati**

Per monitorare l'evoluzione del progetto, è necessario utilizzare strumenti avanzati di raccolta dati. L'uso di piattaforme digitali, sensori IoT (Internet of Things) per *Cloud* e applicazioni mobili permette di raccogliere informazioni in tempo reale su vari aspetti del villaggio, come il consumo energetico, la qualità dell'aria, la gestione dei rifiuti, e la partecipazione civica. Questi dati devono essere poi analizzati per adattare e ottimizzare le politiche in corso.

- **Feedback e valutazione partecipativa**

Un aspetto fondamentale del monitoraggio riguarda la partecipazione continua della comunità. I cittadini devono essere coinvolti nel processo di valutazione attraverso sondaggi, forum online, e incontri pubblici. Questo processo di *feedback* permette di correggere rapidamente eventuali criticità e di adattare le soluzioni alle necessità emergenti.

III.2.2.5 Adattamento e correzioni

Il monitoraggio non è un'attività statica, ma un ciclo continuo che richiede capacità di adattamento. In base ai dati raccolti e alle valutazioni della comunità, è possibile rivedere e modificare le strategie e le azioni intraprese per garantire che gli obiettivi siano raggiunti in modo efficace e sostenibile.

L'implementazione e il monitoraggio di un progetto di *Smart Villages* sono due fasi strettamente interconnesse che permettono di trasformare la visione in realtà. La pianificazione iniziale deve essere seguita da azioni concrete, con una forte attenzione alla partecipazione comunitaria, all'uso della tecnologia e alla sostenibilità. Il monitoraggio continuo e l'adattamento delle strategie sono essenziali per garantire che il progetto resti rilevante e risponda alle esigenze della comunità e del territorio. Il business plan, quindi, non è solo un documento strategico, ma una guida operativa che permette di realizzare un *Smart Village* sostenibile, inclusivo e in sintonia con la sua vocazione territoriale.

Accanto ad un ottimo Business Plan, per uno *Smart Villages*, è poi opportuno elaborare un protocollo di gestione in grado di considerare in che modo le varie componenti devono interfacciarsi tra loro. Questo verrà elaborato nel paragrafo successivo

Fig. III.2.2.5.1 | Petralia Sottana ©Letizia Cardinali, 2024

EXECUTIVE SUMMARY

L'obiettivo dello smart village è promuovere un modello di sviluppo sostenibile che valorizzi il patrimonio locale, coinvolga attivamente la comunità, e integri tecnologie avanzate per migliorare la governance e i servizi. Questo business plan mira a definire le azioni, i costi e le potenzialità di investimento per trasformare il villaggio in un centro culturalmente attivo, turistico, e sostenibile, attirando così nuove opportunità economiche.

DESCRIZIONE DEL PROGETTO

Il progetto prevede un approccio integrato che valorizzi il patrimonio culturale e ambientale del villaggio, potenziando al contempo la qualità dei servizi e favorendo un'economia circolare. Il focus è sull'accessibilità, la digitalizzazione del patrimonio, la creazione di percorsi culturali, e la promozione di iniziative sociali e sostenibili.

ANALISI DI MERCATO

- **Clientela Target:** Residenti locali, turisti culturali, giovani imprenditori, investitori in ambito rurale, enti di formazione e di ricerca, operatori del turismo.
- **Trend di Settore:** Crescente interesse per il turismo sostenibile e le esperienze culturali immersive, sviluppo di tecnologie applicate alla digitalizzazione dei borghi e delle aree rurali, e politiche di sostegno per la rivitalizzazione dei piccoli centri.

OBIETTIVI DI BUSINESS

- **Comunità e Partecipazione**: Incrementare il coinvolgimento attivo della comunità nella gestione del patrimonio, con l'obiettivo di far partecipare il 70% dei residenti alle iniziative entro i primi tre anni.
- **Digitalizzazione e Tecnologia**: Digitalizzare almeno il 50% del patrimonio entro il secondo anno, implementando tecnologie di monitoraggio per la conservazione strutturale.
- **Sostenibilità e Turismo**: Aumentare il flusso turistico del 30% nei primi tre anni, attirando turisti culturali e sostenibili.
- **Occupazione Locale**: Creare opportunità lavorative e formare cooperative locali, riducendo l'esodo giovanile e favorendo l'inclusione di nuove professionalità.

STRATEGIA OPERATIVA

A. Comunità e Partecipazione
- Attività:
  - Organizzazione di workshop, eventi culturali e laboratori artigianali.
  - Creazione di cooperative comunitarie per la gestione dei servizi culturali.
- Costi:
  - Eventi e workshop: €...
  - Formazione e supporto alle cooperative: €.../anno.
- Risultati Attesi:
  - Creazione di una rete di supporto locale.
  - Crescita del senso di appartenenza e partecipazione.

B. Governance e Partnership
- Attività:
  - Sviluppo di regolamenti locali per la tutela del patrimonio.
  - Partnership con enti privati per il co-finanziamento di iniziative culturali e tecnologiche.
- Costi:
  - Studi e piani strategici: €... una tantum.
  - Gestione partenariati: €.../anno.
- Risultati Attesi:
  - Rafforzamento della governance locale.
  - Maggiore accesso a fondi e risorse esterne.

C. Tecnologia e Digitalizzazione
- Attività:
  - Creazione di un archivio digitale del patrimonio, accessibile via app.
  - Implementazione di sensori e tecnologie IoT per il monitoraggio e la manutenzione preventiva.
- Costi:
  - Infrastrutture digitali e app: €...
  - Sensori e manutenzione: €.../anno.
- Risultati Attesi:
  - Maggiore accesso alle informazioni storiche e culturali.
  - Riduzione dei costi di restauro e manutenzione.

D. Valorizzazione del Patrimonio Materiale e Immateriale
- Attività:
  - Restauro di edifici storici, recupero dell'edilizia di base e creazione di percorsi culturali.
  - Organizzazione di eventi annuali come festival culturali e mostre.
- Costi:
  - Recupero e manutenzione: €.../anno.
  - Promozione e marketing turistico: €.../anno.
- Risultati Attesi:
  - Incremento del turismo culturale.
  - Preservazione del patrimonio culturale e ambientale.

Fig. III.2.2.5.2a | Business Plan per uno Smart Villages ©2024, Luisa Lombardo

STRATEGIA DI MARKETING

- **Promozione Digitale**: Sito web e app dedicata con tour virtuali e prenotazioni per visite guidate.
- **Collaborazione con Agenzie Turistiche**: Accordi per inserire il villaggio nei circuiti del turismo culturale.
- **Campagne di Sensibilizzazione Locale**: Educazione della comunità all'importanza della valorizzazione del patrimonio, con comunicazioni su canali social e media locali.

FONTI DI FINANZIAMENTO

- **Fondi Europei e Nazionali**: Ricerca di finanziamenti e bandi a livello europeo per sostenere le infrastrutture digitali e il restauro.
- **Partnership con Enti Privati e Sponsorizzazioni**: Collaborazioni con aziende che possano finanziare eventi e attività, in cambio di visibilità e opportunità di networking.
- **Entrate Generali**: Biglietti d'ingresso per eventi, visite guidate e contributi delle cooperative locali.

ANALISI FINANZIARIA

Voce di Costo	Costo Annuale (€)
Eventi e workshop comunitari	...
Formazione e supporto cooperative	...
Studi e piani strategici	...
Gestione partenariati	...
Infrastrutture digitali e app	...
Sensori e manutenzione	...
Recupero, restauro e manutenzione	...
Promozione e marketing turistico	...
Totale Annuale	**...**

VALUTAZIONE E MONITORAGGIO

- **KPI:** Monitoraggio del coinvolgimento comunitario, flusso turistico, utilizzo delle tecnologie e impatto ambientale.
- **Revisioni Trimestrali:** Valutazione dei progressi, con eventuali aggiustamenti per ottimizzare il piano e adattarsi a nuove opportunità o sfide.

Fig. III.2.2.5.2b | Business Plan per uno Smart Villages ©2024, Luisa Lombardo

III.2.2.6 Protocollo di gestione per lo sviluppo dei Smart Villages

Per il raggiungimento di uno *Smart Village*, è fondamentale seguire, infine, un percorso che nasce ispirato dal modello delle *Smart Cities*, ma è adattato alle caratteristiche e alle necessità specifiche dei contesti rurali. Questo processo si articola tra fasi che prendono in considerazione parametri, obiettivi e network collaborativi (*Fig. 1*).
La realizzazione di uno *Smart Village* richiede una strategia integrata che includa diversi livelli di azione.

Il network collaborativo (Albino et al., 2015) è simile a quello previsto per le *Smart Cities*: il governo locale e regionale, le imprese, le università, e la comunità. Il governo svolge un ruolo cruciale nel fornire la *governance* necessaria e nel promuovere politiche che favoriscano l'adozione delle tecnologie, l'inclusione sociale, e la sostenibilità. Le imprese, in particolare quelle che operano nel settore tecnologico e nelle infrastrutture, sono essenziali per fornire soluzioni innovative. Le università e i centri di ricerca contribuiscono attraverso la produzione di conoscenza, l'innovazione tecnologica e la formazione. La comunità, infine, deve essere attivamente coinvolta nel processo di trasformazione, attraverso la partecipazione a decisioni collettive, la gestione di progetti condivisi e il rafforzamento del capitale sociale.
In primo luogo, è fondamentale sviluppare un'infrastruttura solida, che consenta la gestione e l'interconnessione dei diversi sistemi presenti nello *Smart Village* (Barile et al., 2018). Questo implica oltre a quanto già considerato nel network collaborativo anche gli indici di salute e sicurezza e le risorse naturali (Batagan, 2011). La collaborazione tra diversi attori, la trasparenza nelle decisioni, e il rafforzamento delle capacità amministrative sono aspetti fondamentali per il successo del progetto. Questi devono, poi, concorrere a degli obiettivi da raggiungere, ovvero l'anello 2.
Per poi far funzionare i 2 anelli è necessario un network collaborativo affinchè gli attori del 1° livello e gli obiettivi del 3° livello vengono raggiunti.

Non esistono limiti temporali rigidi per la creazione di uno smart village. Tuttavia, è necessario che la transizione avvenga in modo graduale, rispondendo alle esigenze emergenti del territorio. Il momento ideale per avviare il processo è quando la comunità e le istituzioni sono pronte a intraprendere un percorso di cambiamento (Ciasullo et al., 2020), con una forte volontà di innovare e migliorare le condizioni di vita. Il contesto deve essere poi favorevole, con un supporto politico, risorse economiche e una crescente consapevolezza della necessità di trasformazione.

Anche se il concetto di *Smart Village* è pensato per le aree rurali, ogni contesto ha le sue peculiarità che influenzano il processo di trasformazione. Le dimensioni della comunità, le infrastrutture esistenti, il livello di sviluppo tecnologico e il supporto delle istituzioni locali sono fattori che determinano la fattibilità e la velocità del progetto. Le aree con un buon livello di digitalizzazione e una forte connessione con le politiche europee o nazionali di sviluppo rurale hanno maggiori probabilità di avviare e sostenere con successo un progetto di smart village (Komninos, 2016).

Il percorso verso la creazione di uno smart village richiede, dunque, un approccio olistico che integri tecnologia, sostenibilità, e comunità. Come nelle smart cities, anche negli *Smart Village* è fondamentale un'integrazione tra infrastrutture intelligenti, *governance* efficiente, e un forte coinvolgimento della comunità. Solo attraverso la cooperazione tra pubblico, privato, e la cittadinanza sarà possibile raggiungere una trasformazione duratura e significativa, che contribuisca al benessere delle persone e alla sostenibilità ambientale. Il risultato sarà una comunità rurale più resiliente, innovativa e preparata ad affrontare le sfide del futuro.

Nella pagina successiva lo schema esplicativo del protocollo di Gestione di uno *Smart Village* utile a comprendere la dinamiche relazionali da tenere in considerazione per un villaggio di successo ed esemplare, che parte dal contesto Madonita, tuttavia, può essere calato in altri contesti territoriali per analogia o per contrasto.

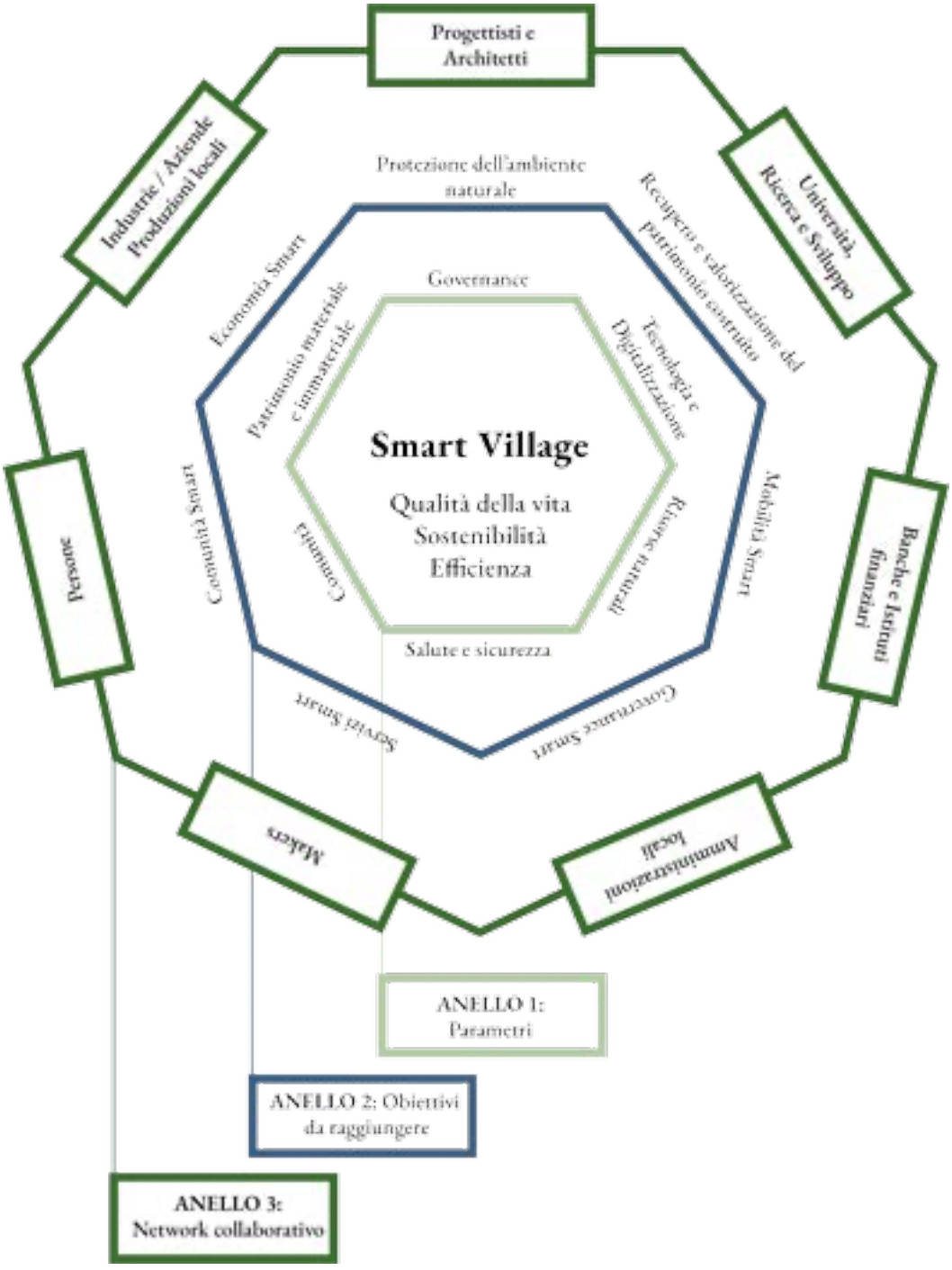


Fig. III.2.2.6.1 | Schema Protocollo di Gestione Smart Village ©Luisa Lombardo, 2024

Fig. III.2.2.6.2 | Indici di protocollo di Gestione ©Luisa Lombardo, 2024

Questi indici indicati in figura servono a determinare gli step necessari per lo sviluppo di uno Smart Village nei piccoli contesti territoriali, partendo dall'analisi SWOT fino alla definizione di un Protocollo di Gestione idoneo, è possibile, infatti, garantire uno sviluppo consapevole di un villaggio intelligente. Garantendo così che ogni step affrontato sia basato su una metodologia solida e basata su strategie idonee e condivise.

III.3 Una rete Smart per le Madonie

Le Madonie, con le loro 21 comunità e comuni distribuite in un paesaggio unico come il Geopark UNESCO del Parco delle Madonie, rappresentano un microcosmo dove storia, natura, cultura e tradizione si intrecciano con le sfide della modernità. La rete Smart per le Madonie nasce sicuramente come un progetto ambizioso, capace di promuovere uno sviluppo sostenibile e integrato, basato su collaborazione e innovazione. Al centro vi è il principio del mutuo soccorso: un sistema in cui i comuni più forti fungono da traino per quelli più deboli, ma in cui la forza della rete risiede nella capacità di lavorare insieme per un obiettivo comune, quello della sostenibilità e del raggiungimento del concetto SMART, e, in particolare, di *Smart Villages*.

La costruzione di una rete Smart (Emerllahu et al., 2024) non può prescindere dal coinvolgimento attivo della comunità che deve sentirsi partecipe e attiva del cambiamento, nonchè promotrice. Gli abitanti delle Madonie sono portatori di conoscenze (Stain et al., 2022), esperienze e tradizioni che rappresentano una risorsa fondamentale per lo sviluppo e il futuro dei territori. La partecipazione deve avvenire attraverso momenti di confronto, laboratori di *co-design* e iniziative di associazionismo, forme di democrazia partecipata, assemblee, incontri, workshop e focus group dedicati ad un tema specifico per volta, in cui le idee nascono dal basso e si trasformano in progetti concreti. È grazie a questa partecipazione che il territorio può esprimere la propria identità, valorizzare le sue specificità e generare un senso di appartenenza.

La *governance* di una rete Smart deve essere inclusiva, trasparente ed efficace nel cogliere le opportunità di finanziamento e supporto che si presentano (Zavranik et al., 2018). Attraverso una pianificazione strategica condivisa, le amministrazioni locali possono intercettare fondi regionali, nazionali ed europei, promuovendo interventi che rispondano ai bisogni specifici del territorio. Un approccio collaborativo, che coinvolga enti pubblici, privati e cittadini, permette di massimizzare le risorse disponibili e di garantire interventi sostenibili e di lungo periodo.

Il patrimonio culturale e naturale delle Madonie rappresenta un elemento chiave per il rilancio del territorio. La tutela e il recupero del patrimonio architettonico e paesaggistico non sono solo interventi conservativi, ma anche occasioni per rivitalizzare il tessuto economico e sociale promuovendo al contempo tradizione e innovazione. Allo stesso modo, le tradizioni immateriali – come le feste popolari, le conoscenze artigianali, le feste religiose e le storie locali – possono essere valorizzate attraverso eventi, percorsi turistici e progetti di narrazione collettiva, che trasformano il passato in una risorsa per il futuro.

Le nuove tecnologie offrono strumenti potenti per affrontare le sfide dei territori rurali. Sistemi di monitoraggio e gestione energetica sostenibile del patrimonio costruito, piattaforme digitali per il turismo e la partecipazione civica, applicazioni per la valorizzazione del patrimonio e il commercio locale sono solo alcune delle soluzioni possibili. La digitalizzazione può anche migliorare l'accesso ai servizi essenziali, riducendo il divario tra le aree interne e i centri urbani (Zavranik et al., 2020). Il futuro delle Madonie passa attraverso l'integrazione di tecnologie innovative che rispettano l'identità

del territorio.

La rete Smart per le Madonie che si deve creare si deve basare sull'equilibrio tra tradizione e innovazione. I progetti sviluppati devono essere radicati nella storia e nella cultura locale, ma aperti a nuove idee e tecnologie. Ad esempio, il recupero di un antico centro minore può avvalersi di materiali e tecniche tradizionali, integrandoli con soluzioni tecnologiche per l'efficienza energetica e la connettività. Questo approccio permette di valorizzare le risorse locali, stimolando al contempo nuove opportunità di sviluppo.

Per sostenere la rete *smart* e garantire che le comunità delle Madonie abbiano accesso alle risorse necessarie, è essenziale dotarsi di strumenti adeguati. Il Rural Toolkit[1] proposto dall'Europa si propone come una guida completa ai finanziamenti e alle opportunità di sostegno dell'Unione Europea per le zone rurali con domande dirette, domande di partecipazione tramite autorità nazionali o regionali e strumenti finanziari. Questa guida fornisce informazioni dettagliate su bandi, programmi e iniziative europee, offrendo supporto concreto per la progettazione e la realizzazione di interventi. Un territorio preparato e ben informato è un territorio che può affrontare le sfide del futuro con maggiore consapevolezza e determinazione (Satola et al., 2022). Tuttavia, è utile avviare un percorso ragionato e consapevole capace di mettere a sistema progetti e processi in maniera sostenibile e virtuosa. Se il toolkit promosso dall'UE funge da ausilio per gli Smart Villages, questa Ricerca vuole, invece, avviare un percorso programmatico volto ad individuare le specificità locali e non una collazione di link per le piccole aree rurali. La speranza è quella di fornire strumenti adeguati che possano tenere in considerazione la vera essenza dei territori superando la generalità dei contesti e considerando l'unicità di ognuno di essi.

La rete Smart per le Madonie, individuata in *Fig. 1*, non è solo un progetto, ma una visione di sviluppo che punta a trasformare il territorio in un esempio di sostenibilità, innovazione e cooperazione. Grazie al mutuo soccorso e a una *governance* inclusiva, le Madonie possono diventare un modello virtuoso per altre aree rurali, dimostrando che la forza della comunità e l'integrazione tra passato e futuro sono le chiavi per un successo duraturo.

Fig. III.1.1 | Polizzi in festa ©Letizia Cardinali, 2024

[1] *[...]The Rural toolkit is the comprehensive guide to EU funding and support opportunities for rural areas in the European Union. It aims to help local authorities, institutions and stakeholders, businesses and individuals to identify and take advantage of existing EU funds, programmes and other funding and support initiatives, and to foster development in rural territories. [...]*

[...] While not explicitly designed for rural development, numerous EU funding programs and initiatives can play a significant role in revitalising and enhancing the quality of life in rural areas. However, identifying the right source of funding or support and how to make the best use of it can be challenging.
The Rural toolkit aims to facilitate local institutions, businesses, associations and individuals in rural areas to navigate the diverse EU funding and support options, and to take full advantage of them.[...]

[...] The toolkit provides a unique entry point to all existing initiatives, with comprehensive information on available resources, and explains why these are relevant for rural areas.
Pactical examples featured on the platform encourage knowledge sharing and peer learning among rural communities. The Get inspired section offers insights on successful initiatives implemented in rural areas across the EU, and on how to combine EU funds effectively to maximise their impact and address specific local needs. Within the toolkit, users will find a range of valuable resources including handbooks and guidance on EU funding opportunities. These resources equip users and applicants with the knowledge and tools needed to address the unique challenges facing rural areas, with an effective, integrated and place-based approach. [...]

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Fig. III.1.2 | Polizzi Generosa dal Drone ©2022, Carmelo Di Salvo

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Conclusioni e Sviluppi Futuri
Conclusion and Future Developments

Nel corso dello sviluppo della presente Ricerca, l'analisi dello stato dell'arte, che ha incluso una revisione ampia della letteratura, delle esperienze e delle pratiche in ambito europeo ed extraeuropeo, si è rivelata fondamentale per comprendere le linee d'azione seguite nel recupero e valorizzazione delle aree interne. In particolare, le interviste condotte con esperti, amministratori locali, professionisti e membri delle comunità hanno permesso di raccogliere preziose informazioni su approcci, metodologie e risultati concreti, ampliando la comprensione del tema e contribuendo a una visione più approfondita e contestualizzata. Le interviste hanno, infatti, offerto uno spunto significativo per riflettere sull'evoluzione delle politiche territoriali, sulle sfide connesse all'implementazione delle tecnologie e sull'approccio di Ricercaapplicato a queste tematiche.

Particolare rilevanza è stata data allo studio di casi di successo a livello italiano ed europeo, che hanno fornito modelli operativi di recupero e valorizzazione sostenibile, evidenziando buone pratiche e soluzioni innovative. L'analisi di casi extraeuropei ha permesso di ampliare la prospettiva, portando alla luce approcci trasversali che mettono al centro il rapporto tra comunità locali, patrimonio e tecnologia, così come la necessità di una governance inclusiva e orientata alla sostenibilità. Questi esempi sono stati essenziali per delineare le traiettorie da seguire, adattandole alle specificità dei territori oggetto della ricerca.

L'esperienza acquisita nel tirocinio presso la Soprintendenza dei Beni Culturali e Ambientali di Palermo ha fornito una prospettiva operativa utile a comprendere come affrontare le problematiche legate alla gestione del patrimonio culturale, in particolare per quanto riguarda il patrimonio costruito che presenta condizioni di degrado, dissesto e vulnerabilità.

Un ulteriore valore aggiunto della Ricercaè stato l'approccio transnazionale, con l'esperienza di studio a Valencia, che ha arricchito il confronto internazionale. L'analisi dei modelli di *Smart Village* implementati in Spagna ha offerto spunti metodologici utili per adattare le soluzioni progettate alle specificità del contesto madonita. In particolare, l'osservazione dei modelli di sviluppo delle aree rurali in Spagna ha mostrato come le tecnologie digitali possano integrarsi efficacemente con il patrimonio locale, creando un equilibrio tra innovazione e tradizione.

In sintonia con gli obiettivi di questo studio, l'output principale elaborato è stato un atlante delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie. L'atlante raccoglie, in

During the development of this research, the analysis of the state of the art, which included an extensive review of literature, experiences, and practices in both European and non-European contexts, proved fundamental to understanding the approaches adopted in the rehabilitation and enhancement of inner areas. In particular, interviews conducted with experts, local administrators, professionals, and community members provided valuable insights into approaches, methodologies, and concrete outcomes, broadening the understanding of the topic and contributing to a more in-depth and contextualized vision. These interviews offered significant input for reflecting on the evolution of territorial policies, the challenges associated with the implementation of technologies, and the applied research approach to these themes.

Special emphasis was placed on the study of successful cases at both the Italian and European levels, which provided operational models for sustainable rehabilitation and enhancement, highlighting best practices and innovative solutions. The analysis of non-European cases further broadened the perspective, shedding light on cross-cutting approaches that prioritize the relationship between local communities, heritage, and technology, as well as the need for inclusive and sustainability-oriented governance. These examples were essential in outlining trajectories to be followed, adapting them to the specificities of the territories examined in the research.

The experience gained during the internship at the Superintendence for Cultural and Environmental Heritage of Palermo provided a practical perspective on addressing the issues related to the management of cultural heritage, particularly regarding built heritage in conditions of decay, instability, and vulnerability.

An additional added value of this research was the transnational approach, enriched by the study experience in Valencia. The analysis of Smart Village models implemented in Spain offered methodological insights useful for adapting the proposed solutions to the specific context of the Madonie region. Specifically, the observation of rural development models in Spain demonstrated how digital technologies can effectively integrate with local heritage, creating a balance between innovation and tradition.

Aligned with the objectives of this study, the primary output was an atlas of technological solutions for the rehabilitation and enhancement of the inner areas of

forma sistematica e organica, le migliori pratiche tecnologiche, che spaziano dall'uso di strumenti digitali per la gestione dei beni culturali e naturali, all'implementazione di soluzioni innovative per migliorare la qualità della vita delle comunità locali. In particolare, sono state selezionate e analizzate soluzioni che favoriscono l'integrazione tra tradizione e innovazione, promuovendo la sostenibilità e l'efficienza nonchè la compatibilità degli interventi. L'atlante offre un'utile guida per la pianificazione territoriale, fornendo riferimenti concreti per amministratori, tecnici e altri stakeholder impegnati nel recupero e nella valorizzazione delle aree interne.

Parallelamente, è stato sviluppato un caso pilota incentrato sul comune di Polizzi Generosa, che ha visto l'elaborazione di linee guida specifiche per il recupero e la valorizzazione del territorio. Queste linee guida, che hanno tratto spunto dall'esperienza all'estero a Valencia e dai manuali comunemente elaborati per la Comunità Valenciana, si fondano su un approccio partecipativo, che coinvolge direttamente la comunità locale nel processo di progettazione e attuazione delle azioni, in modo da rispondere in modo mirato e congruo alle esigenze reali del territorio e, al contempo, conoscere e analizzare le peculiarità territoriali fornendo una proposte e dunque un progetto di recupero per il contesto in esame. Le linee guida, che comprendono strategie per il recupero del patrimonio architettonico, il miglioramento dei servizi locali e la promozione della cultura e del turismo, costituiscono un modello applicabile ad altri comuni delle Madonie, ma anche a contesti simili in altre aree interne.

La Ricerca si è sviluppata all'interno di un quadro metodologico complesso e mirato, orientato a promuovere la valorizzazione dei territori marginali, in particolare quelli appartenenti alle cosiddette "aree interne" o "territori interni". Questi spazi, seppur spesso caratterizzati da uno stato di marginalità socio-economica, possiedono un patrimonio culturale, storico e ambientale che rappresenta un valore irrinunciabile, fondamentale per il futuro delle comunità locali e per lo sviluppo di strategie di crescita sostenibile. La sfida che queste aree pongono va ben oltre il problema dello spopolamento e delle carenze infrastrutturali, e riguarda la preservazione della loro identità tradizionale e culturale, minacciata dai processi di globalizzazione. Questo studio ha esplorato le opportunità di recupero e rilancio di tali aree, facendo leva sulla loro unicità e sui potenziali di sviluppo che risiedono in un'integrazione tra tradizione e innovazione.

Il cuore metodologico della Ricercaè stato l'approccio transdisciplinare, che ha permesso di affrontare la complessità dei territori interni con un'ottica che non si limita a un singolo campo disciplinare, ma abbraccia numerosi ambiti, nonchè il contatto con i territori e l'esperienza diretta di progettazione vivendo a stretto contatto con i territori. L'adozione di un approccio multidisciplinare e diretto ha consentito di analizzare le aree interne in relazione non solo ai loro aspetti fisici e ambientali, ma anche alle dinamiche sociali, culturali ed economiche. Questa metodologia ha reso possibile la definizione di interventi e tecnologie mirati e integrati, in grado di rispondere simultaneamente a più esigenze e di sfruttare le risorse esistenti.

the Madonie Park. The atlas systematically and comprehensively collects the best technological practices, ranging from the use of digital tools for the management of cultural and natural heritage to the implementation of innovative solutions aimed at improving the quality of life for local communities. In particular, the selected and analyzed solutions promote the integration of tradition and innovation, advancing sustainability, efficiency, and the compatibility of interventions. The atlas serves as a valuable guide for territorial planning, providing concrete references for administrators, technicians, and other stakeholders engaged in the rehabilitation and enhancement of inner areas.

In parallel, a pilot case study focused on the municipality of Polizzi Generosa was developed, resulting in the creation of specific guidelines for the rehabilitation and enhancement of the territory. These guidelines, inspired by the experience in Valencia and the manuals commonly developed for the Valencian Community, are based on a participatory approach that directly involves the local community in the design and implementation of actions. This ensures a targeted and coherent response to the real needs of the area while allowing for the analysis of its territorial specificities and the development of rehabilitation proposals tailored to its context.

The guidelines include strategies for the restoration of architectural heritage, the improvement of local services, and the promotion of culture and tourism. They represent a model that can be applied to other municipalities in the Madonie region, as well as to similar contexts in other inner areas.

The research was conducted within a complex and targeted methodological framework aimed at promoting the enhancement of marginal territories, particularly those identified as "inner areas" or "remote territories." These areas, despite often being characterized by socio-economic marginalization, possess cultural, historical, and environmental heritage that represents an invaluable asset essential for the future of local communities and the development of sustainable growth strategies. The challenges these territories face go well beyond the issues of depopulation and infrastructure deficits, encompassing the preservation of their traditional and cultural identity, which is increasingly threatened by globalization processes. This study has explored opportunities for the rehabilitation and revitalization of such areas, leveraging their uniqueness and developmental potential through an integration of tradition and innovation.

The methodological core of the research was a transdisciplinary approach that enabled the complex nature of inner territories to be addressed through a perspective that transcends a single disciplinary field, embracing multiple domains and fostering direct engagement with the territories through immersive design experiences. The adoption of a multidisciplinary and hands-on approach allowed for an in-depth analysis of inner areas, considering not only their physical and environmental characteristics but also their social, cultural, and economic dynamics. This methodology facilitated the identification of targeted and integrated interventions and technologies

L'approccio multiscalare ha permesso di porre il focus sul caso studio delle Madonie, ma anche di estendere lo sguardo a livello nazionale, europeo e dunque anche del Bacino del Mediterraneo, confrontandosi con esperienze simili e migliorando la comprensione delle soluzioni più adeguate per queste realtà. Inoltre, la dimensione multitemporale ha permesso di tracciare l'evoluzione storica di questi territori, evidenziando non solo la loro marginalità, ma anche i cambiamenti socioculturali, economici e politici che hanno contribuito alla loro attuale condizione.

Un concetto centrale della Ricercaè stato quello dello "*Smart Village*", che non viene interpretato come un semplice ricorso alla tecnologia, ma come un approccio globale e integrato che coniuga innovazione, sostenibilità e rispetto delle tradizioni locali, ma soprattutto connessione e mutua collaborazione. In questo contesto, il caso delle Madonie si è rivelato esemplare, in quanto ha mostrato come territori caratterizzati da un significativo ritardo infrastrutturale possano, comunque, offrire ampie risorse naturali, culturali e sociali sfruttando le risorse locali, le peculiarità e la vocazione territoriale trasformandola in volano per uno sviluppo condiviso e sostenibile. Le soluzioni proposte per la creazione di *Smart Villages* in queste aree si sono concentrate sulla coesione sociale, sull'integrazione delle nuove tecnologie con il patrimonio storico e culturale e sull'ampliamento della qualità della vita, con particolare attenzione alla sostenibilità ambientale. L'approccio Smart deve essere visto come un'integrazione di sistemi tecnologici avanzati con un attento recupero e valorizzazione delle risorse architettoniche, storiche e culturali locali, al fine di migliorarne la fruizione e l'efficienza e contribuire allo sviluppo delle aree nonché al loro ripopolamento.

La Ricerca ha anche sottolineato la necessità di una combinazione di azioni in grado di promuovere una *governance* locale che adotti un approccio inclusivo, basato sulla partecipazione attiva delle comunità. Il coinvolgimento dei cittadini nelle decisioni politiche e amministrative è stato identificato come uno degli aspetti chiave per il successo delle politiche di recupero e valorizzazione delle aree interne. La gestione delle risorse naturali e culturali deve essere accompagnata, infatti, da un'efficace pianificazione territoriale, che promuova una sinergia tra la tradizione e le tecnologie innovative.

Nonostante i progressi emersi, la Ricerca ha anche messo in evidenza alcune criticità, tra cui la frammentazione delle politiche pubbliche e la carenza di risorse finanziarie. In particolare, l'approccio competitivo adottato da strumenti normativi come la Strategia Nazionale per le Aree Interne (SNAI) e il Piano Nazionale di Ripresa e Resilienza (PNRR) potrebbe accentuare le disuguaglianze territoriali, limitando l'efficacia delle politiche destinate alle aree interne. In questo contesto, è emersa la necessità di una governance più inclusiva, che adotti una visione integrata e partecipativa, capace di garantire un uso più efficace delle risorse disponibili e una pianificazione strategica condivisa, considerando soprattutto l'aspetto e l'impatto economico a lungo, medio e breve termine.

Un altro aspetto cruciale per il futuro delle aree interne riguarda il capitale sociale e ambientale, elementi indispensabili per il raggiungimento di uno sviluppo equilibrato e

capable of addressing multiple needs simultaneously while harnessing existing resources.

The multiscale approach enabled the research to focus on the case study of the Madonie region while extending its scope to national, European, and Mediterranean contexts. This comparative analysis with similar experiences provided insights into the most appropriate solutions for these realities. Additionally, the multitemporal dimension allowed for a historical exploration of these territories, highlighting not only their marginalization but also the socio-cultural, economic, and political transformations that have shaped their current conditions.

A central concept of the research was the "Smart Village," not merely as a technological solution but as a holistic and integrated approach that combines innovation, sustainability, and respect for local traditions, emphasizing connectivity and mutual collaboration. In this context, the Madonie region proved to be an exemplary case, demonstrating how territories with significant infrastructural delays can nevertheless offer substantial natural, cultural, and social resources. By capitalizing on local assets, territorial uniqueness, and vocation, these resources can be transformed into catalysts for shared and sustainable development.

The proposed solutions for creating Smart Villages in these areas focused on social cohesion, integrating new technologies with historical and cultural heritage, and improving the quality of life, with particular attention to environmental sustainability. The Smart approach must be seen as a synergy between advanced technological systems and the careful rehabilitation and enhancement of local architectural, historical, and cultural resources. This integration aims to improve accessibility and efficiency while contributing to the development and repopulation of these areas.

The research also emphasized the need for a combination of actions to promote local governance that adopts an inclusive approach based on active community participation. Citizen involvement in political and administrative decisions was identified as one of the key aspects for the success of policies aimed at the rehabilitation and enhancement of inner areas. The management of natural and cultural resources must be accompanied by effective territorial planning that fosters synergy between tradition and innovative technologies.

Despite the progress highlighted, the research also pointed out certain critical issues, including the fragmentation of public policies and the lack of financial resources. In particular, the competitive approach adopted by regulatory tools such as the National Strategy for Inner Areas (SNAI) and the National Recovery and Resilience Plan (PNRR) could exacerbate territorial inequalities, limiting the effectiveness of policies targeting inner areas. In this context, the need for more inclusive governance emerged, calling for an integrated and participatory vision capable of ensuring a more effective use of available resources and shared strategic planning, with particular attention to the short-, medium-, and long-term economic impacts.

Another crucial aspect for the future of inner areas

duraturo. La Ricerca ha suggerito che solo attraverso una valorizzazione continua delle risorse architettoniche, naturali, culturali e sociali locali, e un forte coinvolgimento delle comunità, sarà possibile realizzare una crescita che rispetti le peculiarità di ciascun territorio, promuovendo al contempo la sostenibilità. L'implementazione di piattaforme digitali che facilitano la comunicazione e la collaborazione tra cittadini e amministrazioni potrebbe essere una strategia vincente per incrementare la partecipazione civica e migliorare la gestione delle politiche pubbliche.

Guardando al futuro, questa Ricercaha aperto numerose possibilità di sviluppo in ambiti diversi, dall'integrazione di tecnologie applicabili all'uso di energie rinnovabili alla mobilità intelligente, dall'evoluzione della governance alla conservazione e al recupero del patrimonio. La combinazione di innovazione tecnologica, sostenibilità ambientale e partecipazione attiva delle comunità rappresenta una strada promettente per lo sviluppo delle aree interne. Con l'adozione di un approccio integrato e multidisciplinare, le aree rurali potrebbero trasformarsi in modelli di sviluppo sostenibile replicabili non solo in Italia, ma in tutto il Bacino del Mediterraneo.

Questa ricerca apre a molteplici sviluppi futuri, che potrebbero essere esplorati per approfondire e ampliare gli ambiti di indagine relativi al recupero e alla valorizzazione delle aree interne. Un primo ramo di ricerca potrebbe focalizzarsi sull'integrazione avanzata delle tecnologie digitali con il patrimonio architettonico e naturale, con particolare attenzione alla creazione di modelli predittivi per la manutenzione e il recupero dei beni architettonici, basati su sistemi di monitoraggio e intelligenza artificiale; questo approccio consentirebbe di prevedere criticità strutturali e ottimizzare le risorse disponibili.

L'analisi attraverso un Indice, così come è stato fatto per le Smart Cities, che individui il livello di Smartness territoriale evidenziando le strategie da intraprendere.

Un altro filone promettente riguarda l'applicazione di tecnologie sostenibili, come l'utilizzo di energie rinnovabili nei contesti rurali, non solo per promuovere l'autosufficienza energetica, ma anche per integrare queste soluzioni nel recupero di edifici storici, garantendo la compatibilità tra innovazione e tradizione. A ciò si affianca la possibilità di indagare la mobilità intelligente, mirata a potenziare i collegamenti tra aree interne e centri urbani, attraverso soluzioni di trasporto condiviso e a basso impatto ambientale. Un ulteriore ambito di ricerca potrebbe esplorare modelli innovativi di governance partecipativa, con l'obiettivo di studiare strumenti e piattaforme digitali in grado di rafforzare il dialogo tra amministrazioni e cittadini, migliorando l'efficacia delle politiche pubbliche e incrementando il capitale sociale delle comunità locali. Parallelamente, sarebbe utile sviluppare studi approfonditi sulle forme di associazionismo comunitario, come le cooperative di comunità, che rappresentano una leva strategica per lo sviluppo economico locale e la valorizzazione delle risorse endogene.

In una prospettiva multidisciplinare, un filone di ricerca interessante potrebbe riguardare l'analisi del rapporto tra patrimonio culturale e cambiamenti climatici, indagando strategie innovative per rendere i territori più resilienti a eventi estremi, preservando al contempo la loro identità

concerns their social and environmental capital, essential elements for achieving balanced and sustainable development. The research suggested that only through the continuous enhancement of local architectural, natural, cultural, and social resources, combined with strong community involvement, will it be possible to achieve growth that respects the unique characteristics of each territory while promoting sustainability. The implementation of digital platforms that facilitate communication and collaboration between citizens and administrations could be a winning strategy for increasing civic participation and improving the management of public policies.

Looking to the future, this research has opened up numerous possibilities for development in various fields, ranging from the integration of technologies for renewable energy use to smart mobility, from governance evolution to the conservation and rehabilitation of heritage. The combination of technological innovation, environmental sustainability, and active community participation represents a promising path for the development of inner areas. By adopting an integrated and multidisciplinary approach, rural areas could transform into models of sustainable development replicable not only in Italy but throughout the Mediterranean Basin.

This research opens up multiple future developments that could be explored to deepen and expand the areas of investigation related to the rehabilitation and enhancement of inner areas. A first line of research could focus on the advanced integration of digital technologies with architectural and natural heritage, with particular attention to the creation of predictive models for the maintenance and rehabilitation of architectural assets, based on monitoring systems and artificial intelligence; this approach would allow for the prediction of structural criticalities and optimization of available resources.

Analysis through an index, as done for Smart Cities, could identify the level of territorial smartness, highlighting the strategies to be undertaken.

Another promising line involves the application of sustainable technologies, such as the use of renewable energy in rural contexts, not only to promote energy self-sufficiency but also to integrate these solutions into the rehabilitation of historic buildings, ensuring compatibility between innovation and tradition. This could be complemented by the possibility of investigating smart mobility, aimed at enhancing connections between inner areas and urban centers, through shared and low-environmental-impact transport solutions.

A further research area could explore innovative models of participatory governance, with the aim of studying tools and digital platforms that strengthen the dialogue between administrations and citizens, improving the effectiveness of public policies and increasing the social capital of local communities. Simultaneously, it would be valuable to develop in-depth studies on forms of community associationism, such as community cooperatives, which represent a strategic lever for local economic development and the enhancement of endogenous resources.

From a multidisciplinary perspective, an interesting research line could focus on analyzing the relationship

storico-culturale. Ciò potrebbe includere studi sull'impiego di materiali locali e tecniche costruttive tradizionali, reinterpretate in chiave contemporanea, per migliorare le prestazioni energetiche e la durabilità degli interventi.

Lo sviluppo di una rete internazionale di *Smart Villages*, infine, rappresenta un'opportunità di ricerca rilevante, che potrebbe mettere in relazione esperienze diverse a livello globale, favorendo uno scambio di buone pratiche e soluzioni replicabili. Tale rete potrebbe anche supportare la creazione di un modello condiviso di gestione integrata delle risorse, promuovendo una visione olistica dello sviluppo rurale e incentivando la cooperazione tra territori con caratteristiche e sfide simili.

I possibili sviluppi futuri si configurano come un intreccio di percorsi complementari, che combinano innovazione tecnologica, sostenibilità ambientale e valorizzazione del capitale umano e culturale, delineando un quadro di ricerca orientato a una crescita equilibrata e duratura delle aree interne, ma soprattutto che non rendano vana questa Ricerca.

between cultural heritage and climate change, exploring innovative strategies to make territories more resilient to extreme events, while preserving their historical and cultural identity. This could include studies on the use of local materials and traditional building techniques, reinterpreted in a contemporary light, to improve energy performance and the durability of interventions.

Finally, the development of an international network of Smart Villages represents a significant research opportunity, which could connect different experiences globally, fostering an exchange of best practices and replicable solutions. This network could also support the creation of a shared model for integrated resource management, promoting a holistic vision of rural development and encouraging cooperation between territories with similar characteristics and challenges.

Possible future developments appear as an interweaving of complementary paths, combining technological innovation, environmental sustainability, and the enhancement of human and cultural capital, outlining a research framework aimed at a balanced and lasting growth of inner areas, but above all, one that ensures this research does not go to waste.

Fig. 1 | All'interno del Parco elle Madonie ©Quelli del Parco delle Madonie, 2023

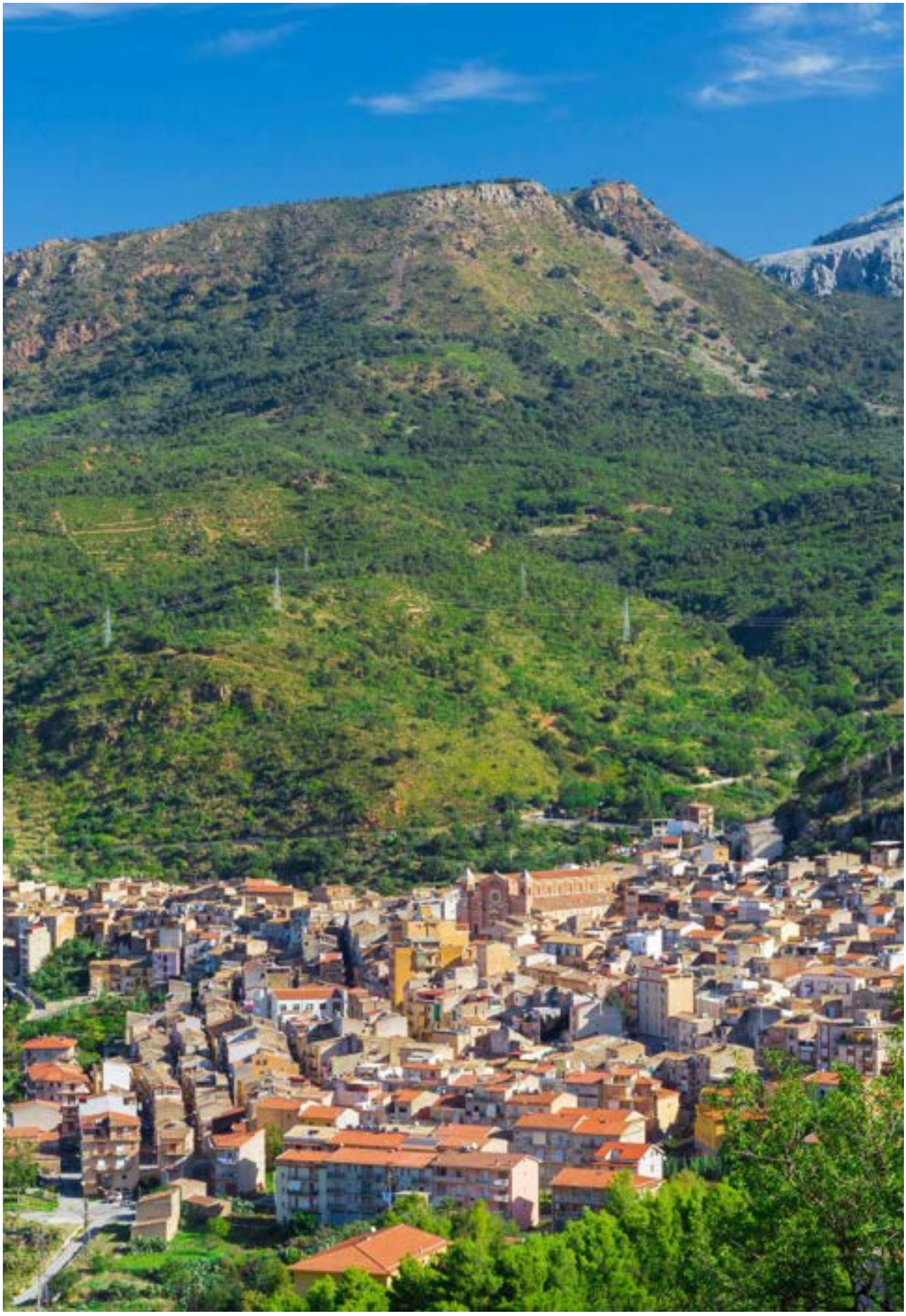

Fig. 1 | Collesano dal drone, uno dei 21 comuni delle Madonie ©Quelli del Parco delle Madonie, 2024

Interviste effettuate

Negli ultimi anni, una parte considerevole della ricerca e degli sforzi pratici si è concentrata sull'esplorazione delle dinamiche dei progetti per il recupero e la valorizzazione delle aree interne, sia italiane che internazionali. Per apprendere dalle esperienze significative condotte in piccoli centri minori, sono state realizzate approfondite interviste con professionisti del settore, tra cui tecnici e professori universitari, al fine di comprendere come siano stati affrontati e risolti i problemi connessi al miglioramento delle condizioni in queste regioni. La maggior parte delle interviste è stata condotta con esperti che hanno dedicato il loro impegno a progetti europei e a Progetti PRIN, focalizzando l'attenzione sulle realtà dei piccoli centri minori e considerando diversi approcci, sia tecnologici che sociali. Inoltre, sono state coinvolte figure professionali, come tecnici, che hanno implementato interventi non solo sul piano architettonico, ma anche su quello strutturale. Alcuni di loro hanno contribuito alla produzione di manuali di recupero, fondamentali per valorizzare e preservare l'identità e il patrimonio culturale di tali centri.

L'insieme di tutte queste interviste, condotte nel corso degli anni, ha rappresentato un punto di partenza cruciale per la stesura del presente elaborato di tesi. Il supporto costante ricevuto durante questo percorso ha giocato un ruolo fondamentale nell'arricchire la ricerca svolta in questi tre anni. A tal proposito, desidero esprimere il mio più sentito ringraziamento a tutti coloro che hanno contribuito a questo lavoro: ai docenti e ai professionisti che, con la loro esperienza e disponibilità, mi hanno fornito preziose indicazioni; ai tecnici e ai partecipanti delle interviste, la cui esperienza sul campo ha dato un contributo indispensabile alla qualità di questo studio. In particolare, ringrazio i membri dei progetti europei e PRIN, che hanno condiviso con me la loro visione sul futuro delle aree interne e sul ruolo della ricerca e dell'innovazione in questi territori.

Il presente elaborato prende in considerazione tutti i soggetti coinvolti, mirandone a evidenziare la multidisciplinarietà e l'approccio inclusivo ed olistico intrapreso nella ricerca. Questo approccio è stato fondamentale per affrontare la complessità delle sfide nelle aree interne, con un focus particolare sul comprensorio delle Madonie in Sicilia. L'obiettivo è quello di adottare una visione a larga scala che tenga conto delle specificità culturali, sociali ed economiche di queste regioni.

L'indagine condotta attraverso le interviste, insieme al contributo continuo di docenti, professionisti e tecnici, ha fornito una base solida per la ricerca e ha offerto stimoli interessanti per l'approfondimento e la riflessione. La speranza è che questo studio possa contribuire a promuovere un cambiamento positivo e sostenibile nelle aree interne, affrontando le sfide in modo integrato e coeso.

Prof. Pierfrancesco Fiore
Professore Associato in Architettura Tecnica
Settore Scientifico-disciplinare: ICAR/10
Dipartimento di Ingegneria Civile
Università degli Studi di Salerno

Prof. Antonella Guida
Professore Ordinario in Architettura Tecnica
Settore Scientifico-disciplinare: ICAR/10
Dipartimento delle Culture Europee e del Mediterraneo-DiCEM
Università degli studi della Basilicata USB

Prof. Ivano Scotti
Ricercatore di sociologia dell'ambiente e del territorio
Settore Scientifico-disciplinare: SPS/10
Dipartimento di Scienze Sociali
Università degli Studi di Napoli Federico II

Prof. Giancarlo Carnevale
Professore in quiescenza di Progettazione Architettonica
Settore Scientifico-disciplinare: ICAR/14
Facoltà di Architettura
Università Iuav di Venezia

Prof. Montserrat Bosch Gonzalez
Professore Associato di Tecnologia dell'Architettura
Dipartimento di Tecnologia dell'Architettura
Facoltà di Architettura
Università Politecnica di Barcellona

Prof. Camilla Mileto
Professore Ordinario
Escuela Técnica Superior de Arquitectura
Dpto. de Composición Arquitectónica
Universitat Politècnica de València

Prof. María Josefa Balaguer Dezcallar
Professore Associato
Escuela Técnica Superior de Arquitectura
Dpto. de Composición Arquitectónica
Universitat Politècnica de València

Ing. Daniele Torrecchia
Ingegnere strutturale - RUP e Responsabile tecnico
Regione Abruzzo

Arch. Pasqual Herrero
Project Manager dello studio El fabricante de espheras
Studio di architettura nel centro storico di Valencia
(http://www.elfabricantedeespheras.com/)

Le interviste con esperti provenienti da diversi settori hanno fornito una panoramica ricca e articolata delle strategie e delle pratiche utili per il recupero, la valorizzazione e la trasformazione dei territori interni, con un focus particolare sull'importanza della partecipazione comunitaria, dell'innovazione tecnologica e della formazione. Ivano Scotti, sociologo, ha sottolineato l'importanza di un approccio strutturato che comprenda tre fasi fondamentali: lo studio preliminare del contesto socio-culturale, la creazione di un ecosistema di attori pubblici e privati, e l'attivazione di casi pilota, in cui l'esperienza pratica diventa il banco di prova per l'applicazione di soluzioni innovative. Ha posto l'accento sull'importanza di coinvolgere una rete variegata di attori, tra cui amministratori locali, enti del Parco, università, agricoltori e associazioni, per costruire un progetto condiviso che possa favorire la rinascita dei piccoli comuni attraverso un modello di governance integrato e sostenibile. Scotti ha anche enfatizzato la necessità di mappare i comuni virtuosi e di stabilire un networking territoriale che coinvolga almeno 4-5 comuni con caratteristiche comuni, ma senza dover coinvolgere l'intero territorio.

Dal lato delle tecnologie e della formazione, l'ingegnere Torrecchia ha analizzato le sfide emerse nella ricostruzione dei paesi dell'Aquila dopo il terremoto, mettendo in evidenza la totale mancanza di formazione specifica per gli interventi strutturali, necessaria per evitare danni collaterali e garantire la sicurezza degli edifici. In questo contesto, ha sollevato la questione della carenza di competenze in ambito edilizio e strutturale, proponendo l'urgenza di creare programmi di formazione ad hoc per i professionisti del settore e gli amministratori locali, in modo da sviluppare interventi più consapevoli e mirati. L'ingegnere ha anche enfatizzato la necessità di adottare tecnologie leggere e reversibili, che possano rispondere alle esigenze di recupero senza alterare l'identità storica e culturale dei luoghi.

In parallelo, il professor Giancarlo Carnevale ha suggerito un modello di formazione mirato alla "rinascita" delle aree interne, incentrato sulla creazione di un sistema educativo diffuso che, attraverso incontri, convegni e attività a costo zero, possa promuovere la produzione intellettuale e stimolare l'innovazione. Carnevale ha anche suggerito di adottare tecnologie leggere, da utilizzare come "protesi" nei contesti tutelati, dove interventi invasivi sarebbero difficilmente accettabili o realizzabili. Ha proposto, inoltre, di evitare il frazionamento degli spazi e di concentrarsi piuttosto sull'utilizzo di spazi estesi, creando una "università diffusa" che possa raggiungere anche le residenze più lontane, attraverso linee guida accessibili a tutti. In questo modo, la formazione non sarebbe solo per i tecnici, ma per un pubblico più ampio, con l'obiettivo di stimolare un cambiamento culturale e di far crescere la consapevolezza tra i cittadini.

La professoressa Montserrat Bosch González ha portato un esempio pratico con il Manuale delle Tecnologie di Barcellona, uno strumento che permette agli utenti di comprendere quanto le loro azioni quotidiane, in particolare quelle legate all'utilizzo della tecnologia, possano avere impatti sociali, economici e ambientali. Questo manuale non è solo uno strumento educativo, ma anche un modo per stimolare il cambiamento nei comportamenti quotidiani, aiutando le persone a prendere decisioni più consapevoli riguardo al loro impatto sul territorio. Bosch González ha anche menzionato un progetto accademico relativo alle aree interne, il cui output consiste in un master che unisce la tutela e la valorizzazione dei territori, con l'obiettivo di creare modelli replicabili e orientati al recupero sostenibile delle risorse.

La professoressa Camilla Mileto ha fornito un ulteriore spunto con i suoi manuali di recupero dei beni tutelati, redatti per contesti valenciani. Questi manuali, commissionati dalla Comunitat Valenciana, si concentrano sulla valorizzazione di piccoli territori attraverso interventi che rispettano e tutelano il patrimonio esistente, proponendo linee guida per un approccio sostenibile alla conservazione e alla valorizzazione dei beni culturali. In particolare, Mileto ha sottolineato l'importanza di considerare il contesto specifico di ogni territorio, evitando approcci standardizzati e puntando invece

su soluzioni che rispondano alle peculiarità di ciascuna area.

In parallelo, la professoressa Pepa Balaguer ha presentato il Manuale di Peñíscola, un altro esempio di come l'approccio "smart" alla valorizzazione del patrimonio possa essere implementato in modo partecipativo. Questo manuale è stato sviluppato non solo per i tecnici, ma anche per i cittadini, invitandoli a diventare parte attiva nei processi di ristrutturazione e recupero del patrimonio edilizio. Balaguer ha sottolineato che l'educazione dei cittadini è fondamentale per garantire che la valorizzazione del patrimonio non sia solo un'operazione tecnica, ma un processo collettivo che coinvolge tutti i membri della comunità.

L'architetto Pasqual Herrero, infine, ha portato esempi di progetti di recupero in Valencia, focalizzandosi sull'importanza di adottare un approccio innovativo che non rinunci però alla tutela del territorio e del paesaggio. Herrero ha sottolineato che, pur utilizzando tecnologie moderne, ogni intervento deve rispettare l'identità culturale e paesaggistica del luogo, cercando di integrare l'innovazione con la tradizione in modo armonioso.

La società eTowns ha presentato un approccio sistemico e partecipativo per il recupero e la valorizzazione dei territori, che mette in rete cittadini, amministrazioni e stakeholder, al fine di sviluppare soluzioni concrete per la sostenibilità economica, sociale e ambientale. L'approccio di eTowns si concentra sulla creazione di piattaforme collaborative che coinvolgano tutte le parti interessate, promuovendo la partecipazione attiva e il co-design per il futuro dei territori. Questo modello mira a stimolare l'innovazione sociale e a garantire che ogni intervento sia sostenibile e condiviso da tutta la comunità.

Le interviste effettuate al Prof. Fiore e alla Prof.ssa Guida hanno rappresentato due contributi fondamentali per orientare e approfondire la ricerca. Il confronto con il Prof. Fiore ha permesso di delineare la complessità delle problematiche legate alle aree interne, ponendo particolare attenzione alla necessità di una visione strategica e sintetica che integri approcci multidisciplinari. I suoi suggerimenti, incentrati sull'importanza di considerare aspetti culturali, ambientali e sociali, così come l'analisi del rischio e la valutazione delle peculiarità locali, hanno arricchito l'impostazione metodologica della tesi. Inoltre, l'accento posto sul concetto di abitare come innovazione, legato al contesto e alla valorizzazione degli elementi caratteristici del territorio, ha fornito spunti cruciali per sviluppare un modello di smart village coerente con la realtà considerata.

D'altra parte, il dialogo con la Prof.ssa Guida ha introdotto un punto di vista fortemente tecnologico e innovativo. Grazie alla sua esperienza nei progetti di Smart Cities e Smart Heritage, è stato possibile approfondire l'applicazione delle tecnologie per il restauro, la digitalizzazione e la creazione di passaporti digitali per i materiali locali. Inoltre, il focus su esperienze come il borgo di Craco e l'integrazione di attività di gamification ha ispirato una riflessione sull'importanza di combinare la tutela del patrimonio con strumenti tecnologici avanzati per promuovere una maggiore accessibilità e coinvolgimento. Le sue indicazioni relative a tecniche sperimentali di consolidamento e restauro, come la criopulitura, hanno fornito un'importante base per affrontare le questioni legate alla conservazione del patrimonio nei centri storici.

Queste interviste offrono una visione articolata e complessa delle potenzialità e delle sfide legate alla valorizzazione dei territori interni, evidenziando la necessità di approcci integrati che uniscano formazione, tecnologie, partecipazione comunitaria e rispetto per il patrimonio, al fine di promuovere uno sviluppo sostenibile e inclusivo.

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Case Study Booklet

Smart Villages
Extraeuropei

Smart Villages
Europei

ALLEGATO 1

Università degli Studi di Palermo

DARCH DIPARTIMENTO DI ARCHITETTURA UNIPA

DRAP DOTTORATO DI RICERCA IN ARCHITETTURA ARTI E PIANIFICAZIONE

Dottorato in Architettura, Arti e Pianificazione
Dipartimento di Architettura DARCH
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architettura Tecnica

CENTRI MINORI INTELLIGENTI NEL PARCO DELLE MADONIE IN SICILIA

STRATEGIE DI RECUPERO E VALORIZZAZIONE DELLE AREE INTERNE

ALLEGATO 1

Case Study Booklet

IL DOTTORE
Ing. Luisa Lombardo

IL COORDINATORE
Prof. Arch. Marco Rosario Nobile

IL TUTOR
Prof. Ing. Ph.D. Tiziana Campisi

Il Tutor della SopriPa:
Arch. Delia Geraci

IL CO-TUTOR
Prof. Arch. Ph.D. Simona Colajanni

Il Tutor (R+):
Prof. Arturo Zaragozá Catalán
Co-Tutor (UPV):
Prof. Rafael Marín Sánchez

CICLIO XXXVII
ANNO CONSEGUIMENTO TITOLO 2025

Ph.D. in Architecture, Arts, and Planning
Department of Architecture (DARCH)
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architectural Engineering

SMART VILLAGES
IN THE MADONIE PARK IN SICILY

STRATEGIES FOR THE REHABILITATION AND ENHANCEMENT OF INNER AREAS

ANNEX 1

Case Study Booklet

THE DOCTOR
Ing. Luisa Lombardo

THE COORDINATOR
Prof. Arch. Marco Rosario Nobile

THE SUPERVISOR
Prof. Eng. Ph.D. Tiziana Campisi

SopriPa Supervisor
Arch. Delia Geraci

THE CO-SUPERVISOR
Prof. Arch. Ph.D. Simona Colajanni

(R+) Supervisor
Prof. Arturo Zaragozá Catalán
(UPV) Co-Supervisor
Prof. Rafael Marín Sánchez

CYCLE XXXVII
YEAR OF DEGREE AWARD 2025

Le buone pratiche di rigenerazione e valorizzazione dei piccoli centri rappresentano una manifestazione della metamorfosi che sta coinvolgendo i territori interni, offrendo esperienze virtuose che agiscono e trasformano gli spazi, le comunità e le relazioni che intercorrono tra di essi. Questi elementi costituiscono un momento indispensabile per la ricerca, considerando le buone pratiche come dispositivi che, nella prospettiva di Michel Foucault, rappresentano una formazione che ha una funzione strategica dominante in un dato momento storico. Si tratta di una manipolazione razionale e concertata dei rapporti di forza, finalizzata a svilupparli in una direzione specifica, bloccarli o stabilizzarli.

Con la consapevolezza dell'urgenza di affrontare le sfide della marginalità fisica, sociale ed economica di una parte estesa del territorio nazionale, questa sezione presenta una mappatura di diverse esperienze di riattivazione e rinascita di alcuni piccoli centri. Riconoscendo il potenziale significativo di tali territori per la rinascita delle località, si propone una riflessione sulla possibilità che le esperienze mappate e analizzate fungano da dispositivi per rileggere i territori in chiave sostenibile, considerandoli come laboratori di futuro.

La sezione si dedica all'analisi di casi studio extraeuropei, europei e italiani allo scopo di confrontare le comunità e gli approcci da esse adottati. Gli esiti di quanto proposto costituiscono una componente utile per la redazione delle linee guida finali per la rinascita dei territori interni. Dopo la costruzione del metodo analitico, ogni esperienza è stata esaminata in base alla metodologia adottata, alla distinzione tra interventi derivanti dalle politiche pubbliche e quelli promossi da iniziative private, al suo carattere innovativo, alla capacità di generare economie e promuovere la riattivazione dei luoghi, e alla scala di applicazione, distinguendo tra casi a scala urbana e casi a scala territoriale.

L'elaborazione di schedature è stata essenziale per creare un quadro conoscitivo di buone pratiche di recupero e valorizzazione dei piccoli centri. La sezione di approfondimento analitico, risultato dell'analisi qualitativa, offre un'ulteriore comprensione delle specificità di ciascun caso, contribuendo a estrarre riferimenti validi per definire possibili approcci futuri al tema della rigenerazione e valorizzazione dei piccoli centri. La catalogazione delle schede, nel dettaglio, ha implicato un'indagine sulle esperienze, condotta attraverso la ricerca in diverse fonti (bibliografiche, web, ecc.), successivamente mappate. Per ciascun caso studiato, sono state elaborate schede di approfondimento. L'obiettivo prefissato è la creazione di un'ipotesi di un vademecum di buone pratiche, che, pur non essendo esaustivo, rappresenti una prima proposta di soluzioni innovative implementabili nel tempo. Tale proposta mira a far emergere le pratiche virtuose di recupero e valorizzazione dei piccoli centri, prestando particolare attenzione alle realtà che operano su sistemi territoriali.

Selezione dei casi studio

Rispetto al grande panorama degli smart villages, sono stati selezionati solo alcuni casi particolarmente interessanti e con tematiche differenti per variegare le strategie di sviluppo. Le esperienze non citate sono comunque reperibili nella tabella a fine di ogni sezione del volume per permettere di comprendere le tematiche affrontate.

- **Smart Villages Extraeuropei**
  Per i casi extraeuropei, la ricerca ha attinto non solo dalla letteratura scientifica e dai libri, ma anche da articoli di giornali e altre fonti per esplorare una vasta gamma di esempi, incluse realtà di nicchia legate al tema degli Smart Villages. Sebbene la maggior parte degli studi si concentri su contesti europei, è stata data particolare attenzione a progetti in regioni del mondo meno esplorate, ampliando così il panorama di riferimento. Questo approccio ha permesso di considerare esperienze innovative e sostenibili in paesi extraeuropei, offrendo una visione globale e più diversificata del fenomeno.
- **Smart Villages Europei**
  Nel quadro della panoramica sui progetti europei di Smart Villages, la ricerca si è concentrata principalmente su villaggi che partecipano al programma Smart Rural 21-27, il cui obiettivo è individuare le vocazioni specifiche dei territori e sviluppare strategie per affrontare situazioni di stagnazione socioeconomica. L'analisi è stata suddivisa in due sottosezioni principali, dedicate ai casi valenciani e italiani.
  1. **Smart Villages Valenciani**
     Per quanto riguarda i villaggi valenciani, l'indagine ha preso come riferimento i luoghi visitati durante il periodo di studio all'estero svolto a Valencia. Questi villaggi sono stati selezionati sulla base dei suggerimenti di docenti e abitanti locali. Le informazioni storiche e territoriali sono state integrate con dati provenienti dalla piattaforma ufficiale della Comunitat Valenciana, che ha fornito una base solida per comprendere le dinamiche specifiche di questi territori.
  2. **Smart Village Italiani**
     Per i villaggi italiani, data l'assenza di una letteratura accademica consolidata, si è fatto ampio ricorso a una vasta gamma di articoli di giornali e altre fonti non accademiche. Inoltre, la partecipazione attiva all'associazione RIFAI (Rete dei Facilitatori delle Aree Interne), di cui si è membri, ha permesso di raccogliere informazioni attraverso interviste e discussioni interne con i soci. È stato prodotto anche materiale divulgativo attraverso articoli pubblicati su blog, finalizzati a sistematizzare e comunicare le strategie smart da proporre ai territori.Questa struttura ha consentito una visione d'insieme dei casi europei, affiancando l'approfondimento di realtà specifiche in Spagna e Italia.

Criteri di selezione

Ai fini della catalogazione e mappatura, è stata condotta una preventiva verifica dei requisiti per ogni pratica. Tale verifica ha coinvolto l'analisi di numerosi altri casi studio, anche non direttamente correlati al territorio in questione o rappresentativi di dinamiche troppo distanti. Il primo livello di verifica è stato definito tramite i "criteri di ammissibilità", composti da tre componenti, i quali devono essere soddisfatti dalle pratiche esaminate. Un secondo livello, definito dai "criteri di qualificazione", comprende quattro categorie di intervento, e l'esperienza deve rispondere a almeno una di esse.

Dopo la verifica dei requisiti di primo e secondo livello, sono state esaminate circa 70 pratiche provenienti da tutto il mondo. Queste esperienze sono state selezionate mediante un approccio qualitativo, considerando il massimo grado di rispondenza

alle quattro tipologie di azioni individuate come criteri di qualificazione. L'obiettivo è costruire un quadro di buone pratiche esteso su tutto il territorio nazionale, per il caso italiano, ma anche mappare ulteriori esperienze significative, talvolta anche non riscontrabili sul suolo italiano.

Criteri di Ammissibilità (Requisiti di Primo Livello)

- **A.1 Definizione di SMART Village**
  Il Comune coinvolto è stato riconosciuto a livello nazionale, europeo o internazionale come SMART, in quanto ha implementato una soluzione innovativa e all'avanguardia, suscitando un riconoscimento mediatico e l'attenzione della stampa locale. Tale identificazione è il risultato della capacità del Comune di sviluppare e promuovere iniziative che si distinguono per la loro innovazione, contribuendo alla notorietà del territorio attraverso una diffusione efficace su vari canali mediatici e tramite la copertura della stampa locale.
- **A.2 Dimensione Demografica**
  Il comune coinvolto deve presentare una popolazione non superiore a 10.000 abitanti, considerando come parametro di riferimento la definizione di "piccolo comune" stabilita dal disegno di legge del 18 aprile 2007, approvato dalla Camera dei Deputati, che fissa a 5.000 abitanti tale limite. Questa definizione si estende fino a 10.000 abitanti, cifra che rappresenta il minimo demografico per la costituzione delle unioni di comuni, specialmente in contesti nazionali e meridionali, dove i centri con popolazione fino a 10.000 abitanti sono considerati realtà fragili (Polci, a cura di, 2015). In alcuni casi, possono essere presi in considerazione comuni con una popolazione maggiore, qualora vi siano esempi virtuosi ancora inesplorati, replicabili nelle piccole aree interne, o nel caso di contesti in cui si realizzi un'unione di più piccole comunità in una strategia condivisa, innovativa e sostenibile.
- **A.3 Comuni Interni**
  Il comune coinvolto deve essere classificato come comune rientrante nell'area interna, come definito dal "DPS (2014), Documento Strategia Nazionale per le Aree Interne: definizioni, obiettivi, strumenti e governance, Accordo 2014-2020". Pertanto, deve essere classificato come intermedio, periferico o ultraperiferico.
- **A.4 Comune costiero**
  Il comune considerato, pur affacciandosi alla costa, ha peculiarità vicine ai piccoli comuni dell'entroterra, ovvero, scarsa presenza di abitanti, scarsi servizi, scarsa innovazione.

Criteri di Qualificazione (Requisiti di Secondo Livello)

La rispondenza ad almeno una delle seguenti categorie di intervento costituisce il requisito di secondo livello per la qualificazione:

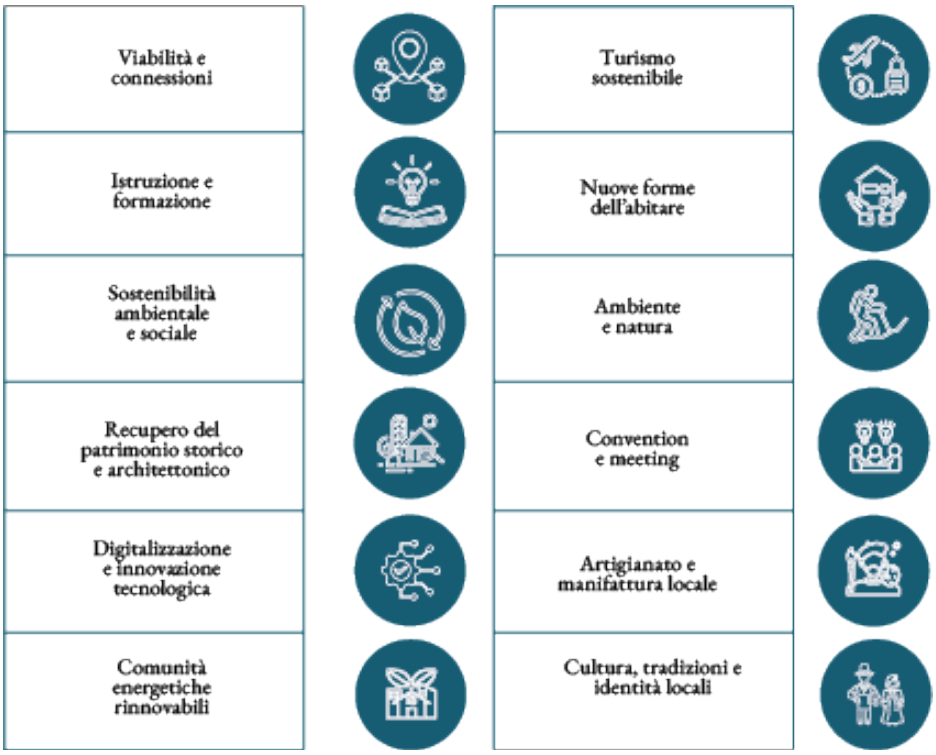
- **B.1 Azioni con finalità turistiche, immobiliari e volte all'ospitalità**
- **B.2 Azioni con finalità produttive e/o commerciali**
- **B.3 Azioni con finalità artistiche, culturali e formative**
- **B.4 Azioni con finalità sociali e cooperative**
- **B.5 Azioni di digitalizzazione**
- **B.6 Azioni di recupero e valorizzazione del patrimonio costruito**
- **B.7 Azioni di governance efficace**
- **B.8 Azioni di miglioramento dell'accessibilità**

Dopo la schedatura e la mappatura dei casi, è stata effettuata una selezione tra quelli considerati tra i più rappresentativi. Questi sono stati sottoposti a successivi approfondimenti e a una schedatura di secondo livello per definire soprattutto gli impatti e i valori prodotti, al fine di generare modelli replicabili in contesti differenti. Per la selezione di questi casi esemplari, sono state scelte le buone pratiche per ogni tipologia di azione progettuale, al fine di costruire un quadro di riferimento di casi virtuosi, pari a otto pratiche. La fase conclusiva riguarda lo studio dei casi internazionali ed è stata elaborata durante le attività come visiting researcher presso la Real Academia de Belles Artes de San Carlos de Valencia e l'Universitat Politecnica di Valencia. Questa fase si sviluppa con lo stesso approccio adottato per i casi italiani, utilizzando le schede precedentemente descritte (adattandole dove necessario), ma analizzando un numero più contenuto di pratiche (una esperienza per ogni categoria).

Tutti i casi studio individuati seguendo la metodologia delineata sono documentati e dettagliati all'interno del "Case Study Booklet", consultabile nel documento allegato all'elaborato di tesi, precisamente nell'Allegato 1. La presente raccolta fornisce un quadro esauriente delle esperienze esaminate, offrendo una visione approfondita delle strategie, delle pratiche e degli impatti associati a ciascun caso studio. L'accesso al "Case Study Booklet" permette ai lettori, studiosi e interessati di esaminare in modo dettagliato e sistematico le diverse iniziative considerate, fornendo un supporto documentato e approfondito alla comprensione dei risultati e delle conclusioni presenti nel contesto dell'elaborato di tesi. La consultazione dell'Allegato 1 rappresenta, pertanto, una risorsa indispensabile per approfondire e contestualizzare ulteriormente le argomentazioni e le analisi proposte nel corso della ricerca.

Al termine del paragrafo successivo viene fornita una scheda tipo, uniforme per l'intero volume, che facilita la comprensione delle schede relative ai casi studio analizzati. Nel dettaglio, in alto a sinistra o a destra, un cerchio color ottanio evidenzia il numero del villaggio, corrispondente alla numerazione riportata nell'indice della sezione di riferimento. Nella fascia superiore sono indicati: la fonte dei dati, l'area geografica e il posizionamento del villaggio, e, quando disponibile, un simbolo che segnala se il villaggio è stato visitato o meno, insieme alle categorie di riferimento. Nella fascia centrale vengono riportati ulteriori dettagli sull'area geografica, sullo smart village considerato, nonché informazioni sul progetto (se disponibili: i fondi impiegati, la durata del progetto e il numero di villaggi coinvolti). Nella parte inferiore sono inserite le foto del villaggio analizzato.

CATEGORIE



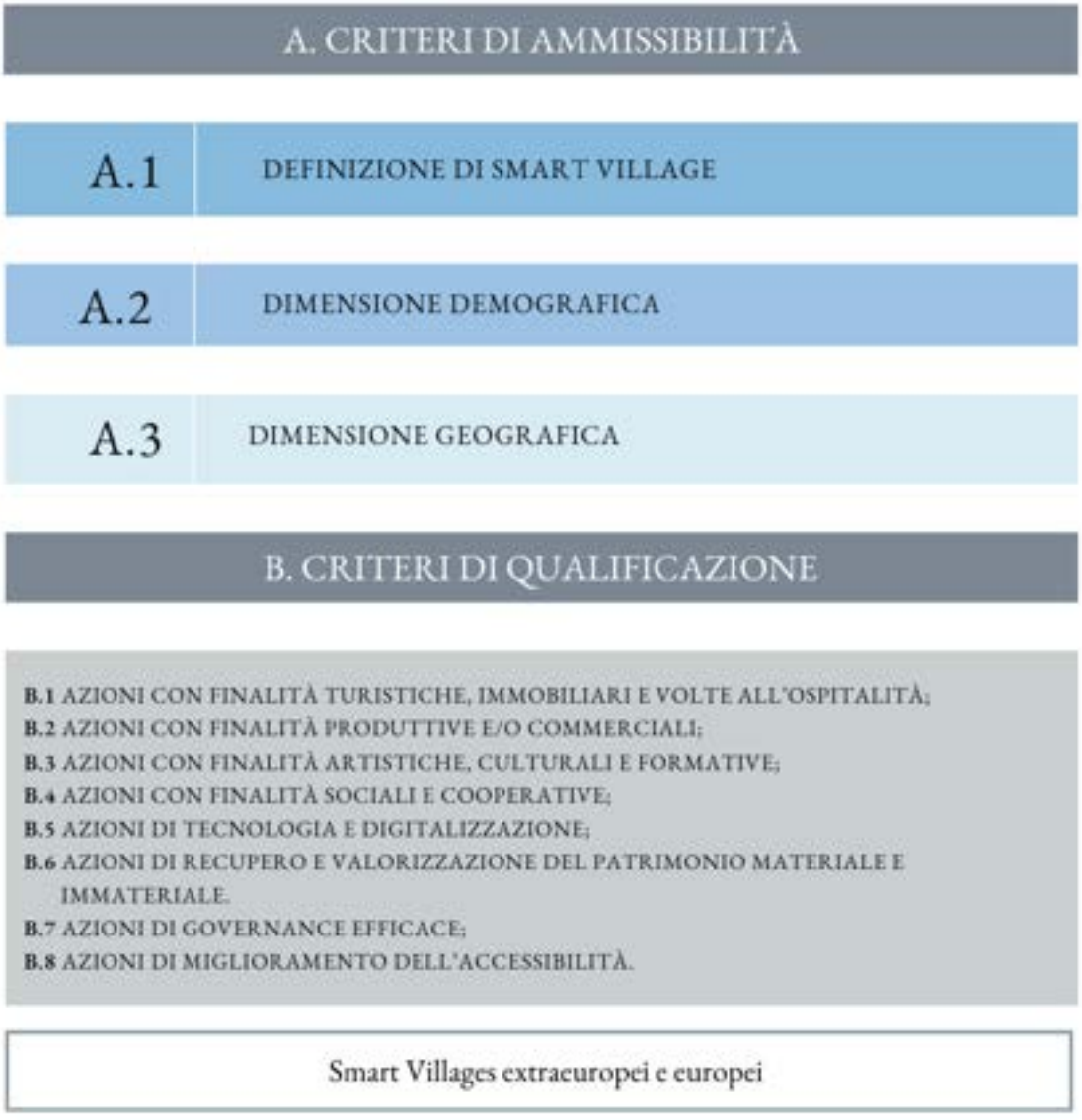


Fig. 1 | Categorie e Schema metodologico della selezione dei casi studio relativi agli Smart Villages © Luisa Lombardo, 2023

Good practices in the regeneration and enhancement of small towns are a manifestation of the transformation affecting internal areas, offering exemplary experiences that act upon and transform spaces, communities, and the relationships between them. These elements are essential for research, considering good practices as devices that, from Michel Foucault's perspective, represent formations with a dominant strategic function at a specific historical moment. This refers to a rational and concerted manipulation of power relations, aimed at developing them in a specific direction, blocking or stabilizing them.

Aware of the urgency to address the physical, social, and economic marginality of a large part of the national territory, this section presents a mapping of various experiences of reactivation and revitalization in some small towns. Recognizing the significant potential of these areas for local revival, the aim is to reflect on the possibility that the mapped and analyzed experiences may serve as devices to reimagine these territories sustainably, considering them as laboratories for the future.

This section focuses on the analysis of extra-European, European, and Italian case studies to compare the communities and approaches they have adopted. The results form a useful component for drafting final guidelines for the revival of internal areas. Following the development of the analytical method, each experience was examined based on the methodology employed, distinguishing between interventions derived from public policies and those promoted by private initiatives, their innovative nature, capacity to generate economies and promote the reactivation of places, and the scale of application, distinguishing between urban-scale and territorial-scale cases.

The creation of case sheets was essential to building a knowledge framework of good practices for the recovery and enhancement of small towns. The analytical in-depth section, resulting from qualitative analysis, provides further insight into the specificities of each case, contributing to the extraction of valid references for defining possible future approaches to the regeneration and enhancement of small towns. The cataloging of these sheets involved an investigation into the experiences, conducted through research across various sources (bibliographic, web, etc.), which were subsequently mapped. For each case studied, in-depth sheets were developed. The goal was to create a preliminary guide of good practices, which, although not exhaustive, represents an initial proposal for innovative solutions that can be implemented over time. This proposal seeks to highlight the virtuous practices of recovery and enhancement of small towns, paying particular attention to those operating on territorial systems.

Selection of Case Studies

In the broad panorama of smart villages, only a few particularly interesting cases with different themes were selected to diversify development strategies. Experiences not cited are still available in the table at the end of each section of the volume, allowing a broader understanding of the topics addressed.

- **Extra-European Smart Villages**
  For the extra-European cases, the research drew not only from scientific literature and books but also from newspaper articles and other sources to explore a wide range of examples, including niche realities related to the theme of Smart Villages. Although most studies focus on European contexts, particular attention was given to projects in less-explored regions of the world, thus expanding the reference panorama. This approach allowed consideration of innovative and sustainable experiences in extra-European countries, offering a more global and diversified view of the phenomenon.
- **European Smart Villages**
  In the context of the European Smart Villages projects, the research mainly focused on villages participating in the Smart Rural 21-27 program, aimed at identifying the specific vocations of territories and developing strategies to address socio-economic stagnation. The analysis was divided into two main subsections, dedicated to Valencian and Italian cases.
  1. **Valencian Smart Villages**
     Regarding Valencian villages, the investigation referenced places visited during a study period in Valencia. These villages were selected based on suggestions from professors and local residents. Historical and territorial information was integrated with data from the official Comunitat Valenciana platform, providing a solid foundation for understanding the specific dynamics of these areas.
  2. **Italian Smart Village Italiani**
     For the Italian villages, due to the absence of consolidated academic literature, extensive use was made of a wide range of newspaper articles and other non-academic sources. Additionally, active participation in the RIFAI (Rete dei Facilitatori delle Aree Interne) association, of which the team is a member, enabled the collection of information through interviews and internal discussions with members. Promotional material was also produced through blog articles, aimed at systematizing and communicating smart strategies to be proposed to the territories. This structure provided an overview of European cases, alongside the detailed study of specific realities in Spain and Italy.

Selection Criteria

For cataloging and mapping, a preliminary verification of the requirements for each practice was conducted. This verification involved the analysis of many other case studies, even those not directly related to the territory in question or representing too distant dynamics. The first level of verification was defined through "eligibility criteria," consisting of three components, which must be met by the practices examined. A second level, defined by "qualification criteria," includes four categories of intervention, and the experience must meet at least one of them.

After verifying the first and second-level requirements, approximately 70 practices from around the world were examined. These experiences were selected through a qualitative approach, considering the highest degree of compliance with the four types of actions identified as qualification criteria. The objective was to build a framework of good practices across the national territory for the Italian case, but also to map other significant experiences, sometimes not found in Italy.

Eligibility Criteria (First-Level Requirements)

- **A.1 Definition of SMART Village**
  The involved municipality must have been recognized nationally, European-wide, or internationally as SMART, having implemented an innovative and cutting-edge solution, attracting media recognition and attention from local press. This recognition stems from the municipality's ability to develop and promote initiatives that stand out for their innovation, contributing to the area's prominence through effective dissemination across various media channels and local press coverage.
- **A.2 Demographic Size**
  The involved municipality must have a population of no more than 10,000 inhabitants, considering as a reference parameter the definition of "small municipality" established by the April 18, 2007, law, approved by the Chamber of Deputies, which sets this limit at 5,000 inhabitants. This definition extends to 10,000 inhabitants, the minimum demographic figure for forming municipal unions, especially in national and southern contexts, where centers with populations up to 10,000 inhabitants are considered fragile realities (Polci, ed., 2015). In some cases, municipalities with larger populations may be considered, provided there are still unexplored virtuous examples, replicable in small internal areas, or in cases where multiple small communities are united in a shared, innovative, and sustainable strategy.
- **A.3 Internal Municipalities**
  The municipality involved must be classified as an internal area municipality, as defined by the "DPS (2014), National Strategy Document for Internal Areas: definitions, objectives, tools, and governance, 2014-2020 Agreement." Therefore, it must be classified as intermediate, peripheral, or ultra-peripheral.
- **A.4 Coastal Municipality**
  The municipality considered, despite being coastal, shares characteristics with small inner municipalities, such as a sparse population, lack of services, and low innovation.

Qualification Criteria (Second Level Requirements)

Compliance with at least one of the following intervention categories constitutes the second-level qualification requirement:

- **B.1 Actions with tourism, real estate, and hospitality purposes**
- **B.2 Actions with productive and/or commercial purposes**
- **B.3 Actions with artistic, cultural, and educational purposes**
- **B.4 Actions with social and cooperative purposes**
- **B.5 Digitalization actions**
- **B.6 Actions for the recovery and enhancement of built heritage**
- **B.7 Actions for effective governance**
- **B.8 Actions to improve accessibility**

After cataloging and mapping the cases, a selection was made of those considered the most representative. These were subject to further in-depth analysis and second-level cataloging to primarily define the impacts and values produced, with the aim of generating replicable models in different contexts. For the selection of these exemplary cases, good practices were chosen for each type of project action, in order to build a reference framework of virtuous cases, totaling eight practices.

The final phase concerns the study of international cases and was developed during activities as a visiting researcher at the Real Academia de Belles Artes de San Carlos de Valencia and the Universitat Politecnica de Valencia. This phase follows the same approach adopted for the Italian cases, using the previously described sheets (adapting them where necessary), but analyzing a smaller number of practices (one experience for each category).

All the case studies identified following the outlined methodology are documented and detailed in the "Case Study Booklet," available in the appendix of the thesis, specifically in Appendix 1. This collection provides a comprehensive overview of the experiences examined, offering an in-depth understanding of the strategies, practices, and impacts associated with each case study. Access to the "Case Study Booklet" allows readers, scholars, and interested parties to examine the various initiatives considered in a detailed and systematic way, providing documented and in-depth support for understanding the results and conclusions presented in the context of the thesis. Therefore, consulting Appendix 1 is an indispensable resource for further contextualizing and understanding the arguments and analyses proposed during the research.

At the end of the following paragraph, a standard template is provided, uniform throughout the entire volume, which facilitates the understanding of the sheets related to the analyzed case studies. Specifically, in the top left or right corner, a teal-colored circle highlights the village number, corresponding to the numbering in the index of the relevant section. In the upper band, the data source, geographic area, and village location are indicated, and, when available, a symbol signals whether the village has been visited or not, along with the relevant categories. The central band provides further details on the geographic area, the considered smart village, as well as information on the project (if available: the funds used, project duration, and the number of villages involved). At the bottom, photos of the analyzed village are included.

Las buenas prácticas de regeneración y valorización de los pequeños centros representan una manifestación de la metamorfosis que está ocurriendo en los territorios interiores, ofreciendo experiencias virtuosas que transforman los espacios, las comunidades y las relaciones entre ellos. Estos elementos constituyen un momento crucial para la investigación, considerando las buenas prácticas como dispositivos que, desde la perspectiva de Michel Foucault, representan una formación con una función estratégica dominante en un momento histórico determinado. Se trata de una manipulación racional y concertada de las relaciones de poder, destinada a desarrollarlas en una dirección específica, bloquearlas o estabilizarlas.

Conscientes de la urgencia de abordar los desafíos de la marginalidad física, social y económica de una amplia parte del territorio nacional, esta sección presenta un mapeo de diversas experiencias de reactivación y renacimiento de pequeños centros. Reconociendo el potencial significativo de estos territorios para el renacimiento de localidades, se propone una reflexión sobre la posibilidad de que las experiencias mapeadas y analizadas actúen como dispositivos para releer los territorios desde una perspectiva sostenible, considerándolos como laboratorios del futuro.

La sección se dedica al análisis de estudios de caso extraeuropeos, europeos e italianos, con el fin de comparar las comunidades y los enfoques que adoptan. Los resultados de lo propuesto constituyen una herramienta útil para la redacción de directrices finales para el renacimiento de los territorios interiores. Después de la construcción del método analítico, cada experiencia fue examinada en base a la metodología adoptada, diferenciando entre intervenciones derivadas de políticas públicas y aquellas promovidas por iniciativas privadas, su carácter innovador, la capacidad de generar economías y promover la reactivación de los lugares, y la escala de aplicación, distinguiendo entre casos a escala urbana y casos a escala territorial.

La elaboración de fichas fue esencial para crear un marco de conocimiento sobre buenas prácticas de recuperación y valorización de pequeños centros. La sección de análisis profundo, resultado del análisis cualitativo, ofrece una comprensión adicional de las especificidades de cada caso, contribuyendo a extraer referencias válidas para definir posibles enfoques futuros al tema de la regeneración y valorización de los pequeños centros. La catalogación de las fichas, en detalle, implicó una investigación sobre las experiencias, realizada a través de la consulta de diversas fuentes (bibliográficas, web, etc.), posteriormente mapeadas. Para cada caso estudiado, se elaboraron fichas detalladas. El objetivo propuesto es la creación de una hipótesis de un vademécum de buenas prácticas, que, aunque no exhaustivo, representa una primera propuesta de soluciones innovadoras implementables con el tiempo. Esta propuesta tiene como objetivo destacar las prácticas virtuosas de recuperación y valorización de los pequeños centros, prestando especial atención a las realidades que operan en sistemas territoriales.

Selección de estudios de caso

En relación con el amplio panorama de los "smart villages", se han seleccionado solo algunos casos particularmente interesantes con temáticas diversas para variar las estrategias de desarrollo. Las experiencias no citadas están disponibles en la tabla al final de cada sección del volumen para permitir una comprensión más amplia de las temáticas abordadas.

- **Smart Villages Extraeuropeos**
  Para los casos extraeuropeos, la investigación no solo se basó en literatura científica y libros, sino también en artículos de periódicos y otras fuentes, explorando una amplia gama de ejemplos, incluidas realidades de nicho relacionadas con el tema de los "Smart Villages". Aunque la mayoría de los estudios se centran en contextos europeos, se prestó especial atención a proyectos en regiones del mundo menos exploradas, ampliando así el panorama de referencia. Este enfoque permitió considerar experiencias innovadoras y sostenibles en países extraeuropeos, ofreciendo una visión global y más diversa del fenómeno.
- **Smart Villages Europeos**
  En el marco del panorama de los proyectos europeos de Smart Villages, la investigación se centró principalmente en aldeas que participan en el programa Smart Rural 21-27, cuyo objetivo es identificar las vocaciones específicas de los territorios y desarrollar estrategias para enfrentar situaciones de estancamiento socioeconómico. El análisis se dividió en dos subsecciones principales, dedicadas a los casos valencianos e italianos.
  1. **Smart Villages Valencianos**
     En cuanto a las aldeas valencianas, la investigación tomó como referencia los lugares visitados durante el período de estudio en el extranjero realizado en Valencia. Estas aldeas fueron seleccionadas sobre la base de las sugerencias de profesores y habitantes locales. La información histórica y territorial se integró con datos provenientes de la plataforma oficial de la Comunidad Valenciana, que proporcionó una base sólida para comprender las dinámicas específicas de estos territorios.
  2. **Smart Villages Italianos**
     Para las aldeas italianas, dada la ausencia de una literatura académica consolidada, se hizo un amplio uso de una variedad de artículos de periódicos y otras fuentes no académicas. Además, la participación activa en la asociación RIFAI (Red de Facilitadores de las Áreas Internas), de la cual se es miembro, permitió recopilar información a través de entrevistas y discusiones internas con los socios. También se produjo material divulgativo a través de artículos publicados en blogs, con el fin de sistematizar y comunicar las estrategias inteligentes que se proponen a los territorios. Esta estructura permitió una visión general de los casos europeos, acompañada de un análisis más profundo de realidades específicas en España e Italia.

Criterios de Selección

Para la catalogación y el mapeo, se realizó una verificación preliminar de los requisitos para cada práctica. Esta verificación implicó el análisis de numerosos estudios de caso, incluso aquellos que no estaban directamente relacionados con el territorio en cuestión o que representaban dinámicas demasiado distantes. El primer nivel de verificación se definió a través de los "criterios de elegibilidad," que consisten en tres componentes, los cuales deben cumplirse en las prácticas examinadas. Un segundo nivel,

definido como "criterios de cualificación," incluye cuatro categorías de intervención, y la experiencia debe cumplir al menos con una de ellas.

Después de verificar los requisitos de primer y segundo nivel, se examinaron aproximadamente 70 prácticas de todo el mundo. Estas experiencias fueron seleccionadas mediante un enfoque cualitativo, considerando el mayor grado de cumplimiento con los cuatro tipos de acciones identificadas como criterios de cualificación. El objetivo era construir un marco de buenas prácticas en todo el territorio nacional para el caso italiano, pero también mapear otras experiencias significativas, a veces no presentes en Italia.

Criterios de Elegibilidad (Requisitos de Primer Nivel)

- **A.1 Definición de SMART Village**
  El municipio involucrado debe haber sido reconocido a nivel nacional, europeo o internacional como SMART, habiendo implementado una solución innovadora y de vanguardia, atrayendo el reconocimiento mediático y la atención de la prensa local. Este reconocimiento proviene de la capacidad del municipio para desarrollar y promover iniciativas que destaquen por su innovación, contribuyendo a la prominencia del área mediante una difusión efectiva en diversos canales mediáticos y cobertura de la prensa local.
- **A.2 Tamaño Demográfico**
  El municipio involucrado debe tener una población no mayor a 10,000 habitantes, considerando como parámetro de referencia la definición de "pequeño municipio" establecida por la ley del 18 de abril de 2007, aprobada por la Cámara de Diputados, que fija este límite en 5,000 habitantes. Esta definición se extiende a 10,000 habitantes, la cifra demográfica mínima para formar uniones municipales, especialmente en contextos nacionales y del sur, donde los centros con poblaciones de hasta 10,000 habitantes son considerados realidades frágiles (Polci, ed., 2015). En algunos casos, se pueden considerar municipios con poblaciones mayores, siempre que aún existan ejemplos virtuosos inexplorados, replicables en pequeñas áreas internas, o en casos donde múltiples pequeñas comunidades estén unidas en una estrategia compartida, innovadora y sostenible.
- **A.3 Municipios Internos**
  El municipio involucrado debe estar clasificado como municipio de área interna, según lo definido por el "DPS (2014), Documento de Estrategia Nacional para Áreas Internas: definiciones, objetivos, herramientas y gobernanza, Acuerdo 2014-2020." Por lo tanto, debe estar clasificado como intermedio, periférico o ultra-periférico.
- **A.4 Municipio Costero**
  El municipio considerado, a pesar de ser costero, comparte características con pequeños municipios interiores, como una población dispersa, falta de servicios y baja innovación.

Criterios de Cualificación (Requisitos de Segundo Nivel)

El cumplimiento de al menos una de las siguientes categorías de intervención constituye el requisito de cualificación de segundo nivel:

- **B.1 Acciones con fines turísticos, inmobiliarios y de hospitalidad**
- **B.2 Acciones con fines productivos y/o comerciales**
- **B.3 Acciones con fines artísticos, culturales y educativos**
- **B.4 Acciones con fines sociales y cooperativos**
- **B.5 Acciones de digitalización**
- **B.6 Acciones para la recuperación y valorización del patrimonio construido**
- **B.7 Acciones para una gobernanza efectiva**
- **B.8 Acciones para mejorar la accesibilidad**

Después de catalogar y mapear los casos, se realizó una selección de aquellos considerados los más representativos. Estos fueron objeto de un análisis más profundo y de una catalogación de segundo nivel, con el fin principal de definir los impactos y valores producidos, con el objetivo de generar modelos replicables en diferentes contextos. Para la selección de estos casos ejemplares, se eligieron buenas prácticas para cada tipo de acción de proyecto, con el fin de construir un marco de casos virtuosos de referencia, sumando un total de ocho prácticas.

La fase final se refiere al estudio de casos internacionales y se desarrolló durante actividades como investigador visitante en la Real Academia de Bellas Artes de San Carlos de Valencia y la Universitat Politècnica de València. Esta fase sigue el mismo enfoque adoptado para los casos italianos, utilizando las fichas previamente descritas (adaptándolas cuando sea necesario), pero analizando un menor número de prácticas (una experiencia por cada categoría).

Todos los estudios de caso identificados siguiendo la metodología descrita están documentados y detallados en el "Cuadernillo de Estudios de Caso," disponible en el anexo de la tesis, específicamente en el Apéndice 1. Esta colección proporciona una visión completa de las experiencias examinadas, ofreciendo una comprensión detallada de las estrategias, prácticas e impactos asociados con cada estudio de caso. El acceso al "Cuadernillo de Estudios de Caso" permite a los lectores, académicos y partes interesadas examinar de manera detallada y sistemática las diversas iniciativas consideradas, proporcionando un respaldo documentado y profundo para comprender los resultados y conclusiones presentados en el contexto de la tesis. Por lo tanto, la consulta del Apéndice 1 es un recurso indispensable para contextualizar y comprender mejor los argumentos y análisis propuestos durante la investigación.

Al final del siguiente párrafo, se proporciona una plantilla estándar, uniforme en todo el volumen, que facilita la comprensión de las fichas relacionadas con los estudios de caso analizados. Específicamente, en la esquina superior izquierda o derecha, un

círculo de color turquesa destaca el número del pueblo, que corresponde a la numeración en el índice de la sección correspondiente. En la banda superior, se indican la fuente de datos, el área geográfica y la ubicación del pueblo, y, cuando está disponible, un símbolo señala si el pueblo ha sido visitado o no, junto con las categorías relevantes. La banda central proporciona más detalles sobre el área geográfica, el pueblo inteligente considerado, así como información sobre el proyecto (si está disponible: los fondos utilizados, la duración del proyecto y el número de pueblos involucrados). En la parte inferior, se incluyen fotos del pueblo analizado.

Fig. 2 | Laghetto Mandria del Conte ©Vittorio Picciuca, 2024

SCHEDA TIPO

N°

Img/Fonte bibliografia
-
Img/Bibliographic Source

Mappa dell'area oggetto di studio
EXTRAEUROPEI
EUROPEI
-
Map of the Area Under Study
EXTRA-EUROPEAN
EUROPEAN

POSIZIONE - *LOCATION*

Villaggio visitato
-
Village Visited

Analisi del contesto territoriale
-
Analysis of the Territorial Context

Strategie dello Smart Village
-
Smart Village Strategies

Dati geografici - *Geographical Data*:

Località - *Location*:
Stato - *Country*:
Regione - *Region*:
Lingua - *Language*:
Orario - *Time Zone*:
Altitudine - *Altitude*:

Dettagli ulteriori del progetto e obiettivi:
-
Additional Project Details and Objectives:

Foto del villaggio
-
Photo of the Village

Tematiche affrontate:
-
Topics Addressed:

Foto del villaggio
-
Photo of the Village

*FONTE BIBLIOGRAFICA - *BIBLIOGRAPHIC SOURCE*

DESCRIZIONE / DESCRIPTION

PRIMA PARTE: INQUADRAMENTO

La prima sezione della scheda è dedicata a fornire un inquadramento generale del villaggio. Qui vengono inseriti elementi chiave per identificare il contesto di riferimento, come la fonte bibliografica da cui sono stati tratti i dati principali o il logo identificativo del progetto. Inoltre, una mappa posizionata strategicamente consente di localizzare il villaggio, sia a livello globale che europeo, per offrire una chiara collocazione geografica. In questa parte viene anche evidenziato un bollino specifico che indica se il villaggio è stato visitato fisicamente o meno, aggiungendo un valore di autenticità all'analisi. Infine, viene riportata la categoria di riferimento, utile per comprendere immediatamente il tipo di villaggio e le sue caratteristiche principali.

FIRST SECTION: OVERVIEW

The first section of the sheet provides a general overview of the village. It includes key elements to establish the context, such as the bibliographic source from which the main data is derived or the project's identifying logo. Additionally, a strategically placed map allows for the geographical location of the village, either on a global or European scale, offering clear spatial context. This section also highlights a specific badge that indicates whether the village has been physically visited, adding authenticity to the analysis. Finally, it includes the reference category, helping to immediately understand the type of village and its primary characteristics.

SECONDA PARTE: CONTESTO TERRITORIALE

La seconda parte della scheda approfondisce il contesto territoriale del villaggio, fornendo una descrizione dettagliata dei dati geografici rilevanti, come l'altitudine, la popolazione e la posizione rispetto alle principali arterie di comunicazione. Qui vengono inoltre analizzate le strategie smart implementate nel villaggio, con particolare attenzione agli interventi mirati all'innovazione, alla sostenibilità e al miglioramento della qualità della vita dei residenti. Questa sezione vuole offrire una panoramica completa sia del territorio in cui si trova il villaggio, sia delle soluzioni intelligenti adottate per il suo sviluppo.

SECOND SECTION: TERRITORIAL CONTEXT

The second part of the sheet delves into the territorial context of the village, providing a detailed description of relevant geographical data, such as altitude, population, and proximity to major transportation routes. It also examines the smart strategies implemented in the village, with a focus on targeted interventions aimed at innovation, sustainability, and improving the quality of life for residents. This section offers a comprehensive view of both the territory in which the village is situated and the intelligent solutions adopted for its development.

TERZA PARTE: FOTOGRAFIA

L'ultima sezione è dedicata alla presentazione di un'immagine rappresentativa del villaggio. La fotografia scelta non è un semplice elemento decorativo, ma un tassello fondamentale che contribuisce a catturare l'identità visiva e culturale del luogo. L'immagine trasmette l'essenza del villaggio, evidenziandone le peculiarità paesaggistiche, architettoniche o sociali, offrendo così un ulteriore strumento per comprendere e valorizzare il contesto descritto nelle sezioni precedenti.

THIRD SECTION: PHOTOGRAPH

The final section is dedicated to presenting a representative image of the village. The selected photograph is not merely decorative but serves as a crucial element in capturing the visual and cultural identity of the location. The image aims to convey the essence of the village, highlighting its distinctive landscape, architectural features, or social characteristics. It provides an additional tool for understanding and appreciating the context described in the previous sections.

Smart Villages Extraeuropei

SMART VILLAGES EXTRAEUROPEI

1. ANUHI
[CINA]

2. BANJUWANGY -
[INDONESIA]

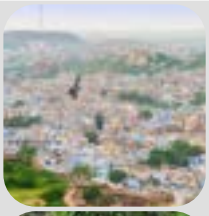
3. BLUEPRINT
[NIGER]

4. CHATTANOGA
[USA]

5. FRESNO
[USA]

6. HARISAL
[INDIA]

7. JEFFERSON
[USA]



8. MORIPODU
[INDIA]

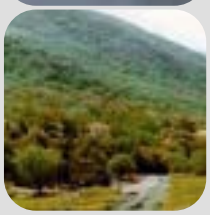
9. OLOPA
[AMERICA LATINA]

10. QINGYANLIU
[CINA]

11. SAATHI
[INDIA]

12. SANDAKPUR
[NEPAL]

13. SMART FARM
[COREA]



14. UCHUNJU AGHALI
[AZERBAIJAN]

SMART VILLAGE

La sostenibilità delle aree rurali sta affrontando numerose sfide in Cina. Il governo cinese ha scelto la costruzione di villaggi intelligenti come una strategia importante per realizzare lo sviluppo sostenibile delle aree rurali. Il villaggio intelligente è un modello che utilizza appieno le soluzioni fornite dalle tecnologie dell'informazione e della comunicazione (ICT) per promuovere lo sviluppo sostenibile del villaggio sulla base del chiarimento delle caratteristiche ed esigenze di sviluppo rurale. I risultati dello studio hanno mostrato che la costruzione e lo sviluppo di villaggi intelligenti nelle zone rurali svantaggiate è la scelta corretta per uno sviluppo rurale sostenibile in base alla situazione attuale in Cina. Il ruolo del governo cinese nella promozione della costruzione di villaggi intelligenti è stato quello di promuovere il sottosistema strategico del sistema dei villaggi intelligenti per migliorare lo sviluppo delle aree rurali intelligenti attraverso a piano generale unificato e relative politiche di supporto. Il modello di costruzione di un villaggio intelligente top-down attualmente adottato dalla Cina è determinato dal sistema politico ed economico cinese, che è principalmente riflesso nella centralizzazione del potere e nel predominio dell'economia pubblica.

Anhui Smart Village

Anhui è un contrasto tra vecchio e nuovo, passato, presente e futuro della Cina. Un microcosmo del futuro innovativo del Paese si affianca a programmi per proteggere e rinvigorire l'artigianato, la cultura e l'architettura secolari. Anhui è costellato di antichi edifici e comunità meravigliosamente conservati e restaurati, tra cui il villaggio di Hongcun e la Tunxi Old Street all'interno della regione montuosa di Huangshan.
Verrà coltivato un certo numero di marchi distintivi di prodotti di e-commerce rurale; La cultura di Internet fiorirà nelle aree rurali; e il sistema di governance digitale rurale sarà continuamente migliorato, secondo il piano. Nel tentativo di accelerare lo sviluppo dei villaggi digitali, la Cina migliorerà ulteriormente le nuove infrastrutture nelle aree rurali, attingerà al potenziale di nuove forme e modelli di business e promuoverà la costruzione di un sistema di governance digitale rurale. La Cina non solo aumenterà il passo nello sviluppo di strutture riguardanti il 5G, l'intelligenza artificiale (AI) e l'Internet delle cose nelle aree rurali per ottenere un'integrazione profonda della tecnologia digitale e dell'agricoltura, ma si sforzerà di migliorare l'alfabetizzazione digitale dei residenti rurali.

Dati geografici:

Località: Anhui
Stato: Cina
Regione: Est Cina
Lingua: Cinese
Orario: GMT+7
Altitudine: 23 metri s.l.m.
Posizione: 31°52′N 117°17′E
N° di villaggi coinvolti: 117 villaggi

Dettagli del progetto e obiettivi:

Numero di progetti: 117 progetti pilota
Periodo del progetto: 2022 - oggi
Il progetto Anhui Smart Village è stato lanciato dal governo di Anhui in Cina nel 2017 e ha lo scopo di costruire 100 villaggi intelligenti in tutta la provincia entro il 2020. Gli obiettivi del progetto Anhui Smart Village sono i seguenti:

- Migliorare la qualità della vita dei residenti nei villaggi.
- Aumentare l'efficienza e la produttività dell'agricoltura.
- Attrarre investimenti privati nei villaggi.
- Creare posti di lavoro nei villaggi.

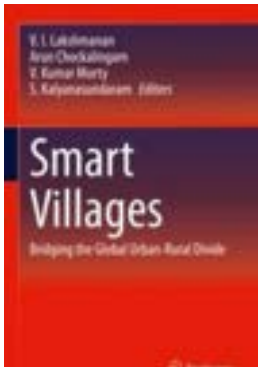
Sistemi di irrigazione intelligenti: per controllare l'irrigazione delle colture, riducendo l'acqua e i pesticidi. **Sistemi di monitoraggio della salute delle colture:** per monitorare lo stato di salute delle colture, identificando i problemi in anticipo e prendendo le misure necessarie per prevenirli. **Sistemi di gestione dei rifiuti:** per monitorare la produzione di rifiuti e la loro gestione, riducendo l'impatto ambientale. **Sistemi di sicurezza:** per rilevare e prevenire i crimini. Sistemi di trasporto: per migliorare la mobilità dei residenti nei villaggi.

Tematiche affrontate:

- Agricoltura intelligente;
- E-commerce rurale;
- Orto condiviso;
- Medicina intelligente;
- Riduzione della povertà;
- Tecnologie dell'informazione e della comunicazione (TIC).

*Jiang Zhi Rong & Zhu Bian. (2000). China's top ten village in Xiaogang Village of Anhui. Zhejiang Garden Village. Lanzhou University Press. ISBN 7311033977/ ISBN 9787311033972

BANJUWANGY - INDIA



SMART VILLAGE

L'obiettivo della ricerca è costruire l'attuazione del Programma Smart Village (Kampung) come innovazione del servizio pubblico nella reggenza di Banyuwangi. La ricerca contribuisce al progresso della scienza della pubblica amministrazione e fornisce anche riferimenti a governo, accademici, persone, privati e parti interessate per lo sviluppo di un'innovazione migliore e sostenibile del servizio pubblico. Il metodo di ricerca è un approccio qualitativo che coinvolge attività di ricerca, comprensione, spiegazione e ottenimento di descrizioni sui fenomeni sociali e pubblici. La realizzazione dell'innovazione del servizio pubblico avviene attraverso lo sviluppo di villaggi da integrare con la tecnologia dell'informazione e della comunicazione basata su fibra ottica che enfatizza le opere economiche produttive, opere economiche creative, miglioramento dell'istruzione e della salute e sradicamento della povertà. Il risultato della ricerca ha mostrato che il governo di Banyuwangi Regency ha avuto successo nella conduzione del programma Smart Village (Kampung) per l'innovazione del servizio pubblico. Banyuwangi Regency ha vinto l'Innovative Government Award (IGA) Contest 2019 per la categoria "Innovative Regency".

Smart Village in Banjuwangy Regency

Il programma Smart Kampung è un concetto di sviluppo per il nuovo villaggio in via di sviluppo. L'applicazione di questo programma nella reggenza di Banyuwangi ha consegnato con successo un prestigioso premio alla reggenza. Pertanto, questo programma è selezionato come argomento di ricerca. La nascita del Programma Smart Village (Kampung) può ispirare altre regioni (reggenza o città) a utilizzare la storia di successo di Banyuwangi Regency come lezione da imparare. Otto priorità costituiscono il Programma Smart Village (Kampung) a Banyuwangi Regency. Queste priorità sono l'economia, la povertà, l'istruzione e la cultura, l'arte, la salute, il servizio pubblico, l'informazione pubblica, la finanza e le risorse umane. Banyuwangi Regency presta grande attenzione a queste priorità e stanzia diversi gradi di sforzi per raggiungerle.

Dati geografici:

Località: Banjuwangy Regency
Distretto: 24 distretti Kecamatan
Stato: Indonesia
Regione: Giava orientale
Lingua: Giavanese
Orario: GMT+7
Altitudine: 24 - 174 m s.l.m.
Numero di abitanti: 1.540.000

Dettagli del progetto e obiettivi:

Migliorare la qualità della vita: utilizzo di tecnologie innovative. Ad esempio, i villaggi intelligenti possono utilizzare l'intelligenza artificiale per migliorare i sistemi di trasporto, fornire servizi di assistenza sanitaria e migliorare la sicurezza pubblica.
Creare posti di lavoro: assunzione di sviluppatori di software, ingegneri e esperti di sicurezza informatica.
Attraere investimenti: investimenti da aziende e investitori.
Migliorare la competitività: migliorare la competitività dei paesi e delle regioni; aiutare le aziende a ridurre i costi, migliorare l'efficienza e aumentare la produttività.

Numero di villaggi coinvolti: 217 villaggi
Partners e Aziende: 90
Periodo del progetto: 2016 - oggi

Tematiche affrontate:

- Risorse umane;
- Struttura e infrastruttura;
- Socializzazione.

*Lakshmanan, V. I., Chockalingam, A., Murty, V. K., & Kalyanasundaram, S. (Eds.). (2022). Smart Villages: Bridging the Global Urban-Rural Divide (1st ed.). Springer Cham. https://doi.org/10.1007/978-3-030-68458-7

Il contesto: NIGER

Il Niger è un paese dell'Africa occidentale senza sbocco al mare. Confina con l'Algeria a nord, il Ciad a est, la Nigeria e il Benin a sud e il Mali e il Burkina Faso a ovest. Ha una superficie di 1.267.000 chilometri quadrati (489.700 miglia quadrate), il che lo rende il 42° paese più grande del mondo. La capitale e la città più grande del Niger è Niamey.
La popolazione del Niger è di circa 23,2 milioni di persone (2022), il che lo rende il 30° paese più popoloso del mondo. La lingua ufficiale del Niger è il francese. Le lingue più parlate sono il hausa, il zarma e il songhai. La religione principale del Niger è l'islam (55%), seguita dal cristianesimo (40%) e da altre religioni (5%).
L'economia del Niger è basata sull'agricoltura, l'allevamento e l'estrazione mineraria. I principali prodotti agricoli del Niger sono il cotone, il sorgo, il mais e il miglio. I principali minerali del Niger sono l'uranio, il rame, lo zinco e l'oro. Il Niger è un paese povero con un alto tasso di analfabetismo e mortalità infantile.
Il Niger è un membro delle Nazioni Unite, dell'Unione Africana e della Comunità economica degli Stati dell'Africa occidentale.

SMART VILLAGE BLUEPRINT

Lo Smart Village Blueprint, pilotato in Niger, è uno strumento pratico per la creazione di villaggi intelligenti. Contribuisce alla realizzazione del progetto Niger 2.0 Smart Villages, che mira a fornire infrastrutture a banda larga per migliorare l'accesso a Internet nelle zone rurali e remote del paese, la modernizzazione dei pagamenti degli agricoltori, e la creazione di piattaforme digitali per i lavoratori agricoli. Il progetto comprende un approccio locale, integrato e olistico per fornire accesso ai servizi digitali a tutti i cittadini delle comunità rurali, con l'integrazione di tecnologie digitali che servono come un fattore cruciale di equità, la fornitura qualitativa ed efficiente di servizi relativi all'SDG per tutti. La maggior parte dei paesi delle regioni dell'Africa e dell'Asia-Pacifico ha un elevato numero di persone che vivono nelle aree rurali. In Burundi e in Uganda, l'88,24% e l'84,23% della popolazione vive in distretti rurali. In Nepal, la maggior parte della popolazione (81,76%) occupa zone rurali. Nella regione Asia-Pacifico, Samoa ha l' 80,74%, e sulle isole Salomone, il 78,12% della popolazione vive in aree rurali. Il governo del Niger investirà 107 milioni di dollari per collegare circa 1,4 milioni di persone alla connettività e 2.111 villaggi ai servizi mobili e a banda larga nei prossimi sei anni con un investimento di 107 milioni di dollari.

Dati geografici:

Stato: Niger, Africa
Lingua: Francese
Orario: UTC/GMT +1:00 ora
Altitudine: 1.000 metri s.l.m.
Posizione: 17° 35' 48.77" N; 8° 04' 58.26" E
Numero di villaggi coinvolti: 2.111

Obiettivi dello Smart VIllage Blueprint

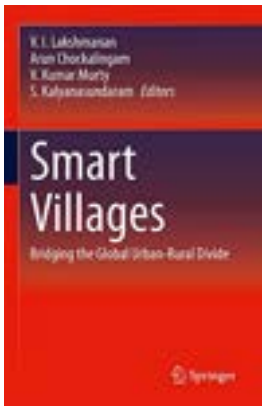
Importo del progetto: 107 milioni di dollari
Partners: SDG Lab
Periodo del progetto: 2021 - 2026
• **Sanità**: diffusione dei servizi sanitari digitali e di telemedicina per consultazioni a distanza e servizi efficienti;
• **Banking**: sostenere l'accesso ai servizi finanziari e di investimento digitali.
• **Istruzione**: opportunità di apprendimento aperte e a distanza per sviluppare le proprie capacità, accesso equo all'alfabetizzazione di qualità, all'apprendimento permanente e ai programmi di competenze.
• **Ricerca di lavoro**: servizi per i disoccupati e migliorare le loro capacità lavorative.
• **Agricoltura**: i servizi di agricoltura digitale per supportare capacità agricole efficienti e produttive tra gli agricoltori.
• **Prevenzione della criminalità**: applicazioni e servizi per le forze dell'ordine locali per comunicare e condividere informazioni in tempo reale per proteggere le comunità.

Tematiche affrontate:

- Rafforzamento delle capacità;
- Trasformazione digitale;
- Infrastruttura digitale, Banda larga e Connettività;
- Divario digitale e competenze;
- ITU-D (Unione Internazionale delle Telecomunicazioni - Settore dello Sviluppo);
- TIC (Tecnologie dell'informazione e della comunicazione).

*International Telecommunication Union. Building Smart Villages: A Blueprint. (2020), ISBN: 978-92-61-29201-0

CHATTANOOGA - USA



Chattanooga nel Tennessee

Chattanooga è una città nel sud degli Stati Uniti, capoluogo della contea di Hamilton, Tennessee. La città si trova alla confluenza dei fiumi Tennessee e Chickamauga, a circa 180 km a sud di Nashville. Chattanooga è una città ricca di storia e cultura. La città fu fondata nel 1817 e divenne presto un importante centro commerciale e di trasporto. La città fu anche un importante campo di battaglia durante la guerra civile americana. Chattanooga è oggi una città moderna e vibrante. La città è sede di numerose aziende, tra cui Volkswagen, U.S. Xpress e BlueCross BlueShield of Tennessee. Chattanooga è anche una destinazione turistica popolare, grazie alla sua posizione sulle rive del fiume Tennessee, ai suoi numerosi musei e ai suoi parchi. Alcuni dei luoghi di interesse più popolari di Chattanooga includono:
The Tennessee Aquarium: l'acquario più grande del sud degli Stati Uniti
The Choo Choo: un'ex stazione ferroviaria trasformata in un museo e un centro commerciale.The National Civil Rights Museum: un museo dedicato alla storia dei diritti civili negli Stati Uniti. Point Park: un parco panoramico con vista sul fiume Tennessee. The Hunter Museum of American Art: un museo d'arte che ospita una collezione di arte americana. The Chattanooga Zoo: uno zoo che ospita oltre 1.500 animali

Smart Village Chattanooga

Chattanooga è una città del Tennessee che è stata in prima linea nell'adozione di tecnologie intelligenti. Nel 2014, la città ha lanciato il progetto "Smart Village", un piano pluriennale per trasformare Chattanooga in una città più sostenibile, efficiente e vivibile. Il progetto "Smart Village" si basa su una serie di tecnologie, tra cui sensori, software e analisi dei dati. Queste tecnologie vengono utilizzate per migliorare i servizi pubblici, ridurre i costi, migliorare la sicurezza e migliorare la qualità della vita dei cittadini. Alcuni degli esempi di come il progetto "Smart Village" è stato utilizzato a Chattanooga includono: L'utilizzo di sensori per monitorare il traffico e ottimizzare i tempi dei semafori, riducendo i tempi di percorrenza e le emissioni di gas serra. L'utilizzo di software per prevedere i guasti alle infrastrutture e garantire che i servizi pubblici siano disponibili quando necessario. L'utilizzo di analisi dei dati per identificare i quartieri a rischio e implementare programmi per migliorare la sicurezza. Il progetto "Smart Village" ha avuto un impatto positivo sulla città di Chattanooga. Il traffico è diminuito, i costi sono stati ridotti, la sicurezza è migliorata e la qualità della vita dei cittadini è aumentata.

Dati geografici:

Stato: Tennessee
Regione: Sud degli Stati Uniti
Lingua: Inglese
Orario: UTC-5
Altitudine: 241 metri s.l.m.

Dettagli del progetto e obiettivi:

Importo del progetto: 100 milioni di dollari
Numero di villaggi coinvolti: 10
Partners e Aziende: City of Chattanooga, Tennessee Valley Authority, Google, Microsoft, Cisco, IBM, Intel, Oracle, SAP
Periodo del progetto: 5 anni

- Migliorare i servizi pubblici utilizzando tecnologie avanzate.
- Ridurre i costi operativi della città.
- Aumentare la sicurezza attraverso l'analisi dei dati.
- Migliorare la qualità della vita dei cittadini.
- Ridurre il traffico e le emissioni di gas serra.
- Prevedere e prevenire i guasti alle infrastrutture.
- Identificare e migliorare i quartieri a rischio.

Tematiche affrontate:

- Trasporti;
- Energia;
- Sicurezza;
- Istruzione;
- Sostenibilità;
- Efficienza;
- Qualità della vita.

*Lakshmanan, V. I., Chockalingam, A., Murty, V. K., & Kalyanasundaram, S. (Eds.). (2022). Smart Villages: Bridging the Global Urban-Rural Divide (1st ed.). Springer Cham. https://doi.org/10.1007/978-3-030-68458-7

Fresno in California

Fresno è una città della California centrale, Stati Uniti, con una popolazione di circa 540.000 persone. È la sede della contea di Fresno ed è la quinta città più grande della California. Fresno si trova nella valle centrale della California, a circa 200 miglia a sud di San Francisco e a circa 230 miglia a nord di Los Angeles. Fresno è stata fondata nel 1856 da John Sutter e James Marshall. La città è cresciuta rapidamente grazie alla sua posizione strategica nella valle centrale e alla sua fertilità del suolo. Oggi, Fresno è un importante centro agricolo, con una forte industria della frutta e verdura. La città ospita anche una serie di industrie manifatturiere, tra cui l'aerospaziale, l'elettronica e la tecnologia. Fresno è anche un importante centro culturale, con una serie di musei, teatri e gallerie d'arte. La città ospita anche una serie di squadre sportive professionistiche, tra cui i Fresno Grizzlies (baseball), i Fresno State Bulldogs (football universitario) e i Fresno Falcons (hockey su ghiaccio). Fresno è una città multiculturale, con una popolazione diversificata che proviene da tutto il mondo. La città è famosa per il suo clima caldo e soleggiato, con un'estate media di 35 gradi Celsius e un inverno medio di 15 gradi Celsius.

Smart Village Fresno

L'utilizzo di sensori per monitorare il traffico e ottimizzare i tempi dei semafori, riducendo i tempi di percorrenza e le emissioni di gas serra.
L'utilizzo di tecnologie solari e eoliche per generare energia pulita, riducendo la dipendenza dalla rete elettrica e le emissioni di gas serra.
L'utilizzo di sensori e software per monitorare la città e identificare potenziali minacce, migliorando la sicurezza dei cittadini.
L'utilizzo di tecnologie digitali per fornire ai cittadini l'accesso all'istruzione e alla formazione, migliorando le opportunità di lavoro e la qualità della vita dei cittadini.
Utilizzo di sensori per monitorare le condizioni del suolo e dell'acqua, in modo da ottimizzare l'irrigazione e ridurre il consumo di acqua.
Utilizzo di droni per ispezionare i campi e identificare eventuali problemi, come infestazioni di parassiti o malattie.
Utilizzo di software per analizzare i dati raccolti dai sensori e dai droni, in modo da migliorare le decisioni agronomiche.

Dati geografici:

Stato: California
Regione: Valle Centrale della California
Lingua: Inglese
Orario: Pacific Standard Time (UTC-8)
Altitudine: 94 metri s.l.m.

Dettagli del progetto e obiettivi:

Importo del progetto: 100 milioni di dollari
Numero di villaggi coinvolti: 10
Partners e Aziende: City of Fresno, Tennessee Valley Authority, Google, Microsoft, Cisco, IBM, Intel, Oracle, SAP
Periodo del progetto: 5 anni
Obiettivi

- Monitorare il traffico e per ridurre i tempi di percorrenza e le emissioni di gas serra.
- Utilizzare energie solari ed eoliche per generare energia pulita.
- Monitorare la città con sensori e software per migliorare la sicurezza.
- Fornire accesso all'istruzione e alla formazione attraverso tecnologie digitali.
- Utilizzare droni per ispezionare i campi.
- Analizzare i dati raccolti dai sensori e dai droni con software per migliorare le decisioni agronomiche.

Tematiche affrontate:

- Sicurezza;
- Sostenibilità;
- Efficienza;
- Qualità della vita.

*Patnaik, S., Sen, S., & Mahmoud, M. S. (Eds.). (2020). Smart Village Technology: Concepts and Developments (1st ed.). Springer Cham. https://doi.org/10.1007/978-3-030-37794-6

HARISAL - INDIA

Regione di Melghat

La regione di Melghat in Maharashtra è stata selezionata per il progetto di villaggio intelligente a causa del suo basso sviluppo risultati nel campo dell'istruzione e della sanità, infrastrutture fisiche inadeguate e una connettività digitale trascurabile. È stato costituito un modello di partenariato pubblico-privato comprendente membri della comunità, enti governativi statali, distrettuali e di villaggio e imprese. Il progetto è guidato dal Gom ed è stato implementato da Microsoft in collaborazione con varie imprese del settore pubblico e privato. Come parte della Digital India Initiative, la pianificazione del progetto e la gestione delle TIC è stata sostenuta dal National Informatics Centre (NIC).
Il governo ha istituito una struttura istituzionale a tre livelli presso l'ufficio del governo centrale (per consentire il coordinamento tra alti funzionari del governo e accelerare la consegna del programma); livello distrettuale (coinvolgendo l'ufficio dei collezionisti distrettuali); e livello del villaggio (costituendo un ufficio villaggio digitale composto da un project manager e un comitato villaggio digitale di 15 membri).

Harisal del Maharashtra

Harisal, un piccolo villaggio con una popolazione di 1.479 persone, è stato storicamente caratterizzato da bassi indicatori di sviluppo umano per scarsa infrastruttura pubblica e delle limitate opportunità di lavoro. Questo ha comportato sfide significative per la comunità locale, con un accesso inadeguato a servizi essenziali come l'istruzione e la sanità, nonché una mancanza di opportunità economiche che ha ostacolato la crescita e il benessere degli abitanti.
Lo scopo è stato quello di affrontare queste sfide migliorando le competenze degli abitanti, incrementando l'accesso ai servizi sanitari, aumentando la produttività agricola, migliorando la connettività digitale, creando nuove opportunità di sostentamento e rafforzando la governance locale. Il governo ha posto come obiettivo l'incremento del prodotto interno lordo (PIL) del villaggio attraverso l'innovazione tecnologica e sociale, con la consapevolezza che tali miglioramenti avrebbero avuto un effetto moltiplicatore su varie altre aree di sviluppo. La promozione dell'uso di tecnologie avanzate nel settore agricolo, l'introduzione di soluzioni sanitarie digitali e il potenziamento dell'istruzione attraverso piattaforme online sono stati alcuni dei passi chiave intrapresi.

Dati geografici:

Paese: Harisal del Maharashtra
Stato: India
Lingua: Hindi
Orario: GMT+5:30
Altitudine: 3.000 metri s.l.m.
Posizione: 27.01 N, 87.93 E
Abitanti: 106.894.000 ab.

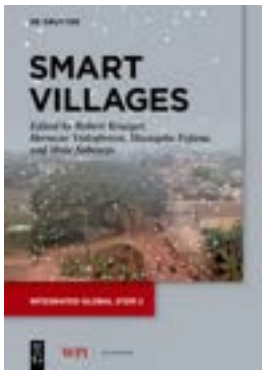
Obiettivi:

Partners e aziende: Microsoft
Periodo del progetto: 2015 - oggi
• **Connettività digitale** - linea in fibra ottica, hotspot Wi-Fi pubblico, connessioni a banda larga e torre mobile;
• **Sanità** - Telemedicina, centro diagnostico con tele-oftalmologia dispositivo, sistema e-Primary Health Centre, activitybased moduli di apprendimento sulla salute infantile e materna e portale web sugli indicatori nutrizionali;
• **Istruzione e formazione professionale**: e-learning, aule digitali, TIC e Tally classi di contabilità per i giovani rurali e centro di formazione professionale per le donne;
• **Governance** - Centro per i servizi ai cittadini per la fornitura di servizi di amministrazione elettronica e di e-public Sistema di Distribuzione;
• **Servizi finanziari digitali** - pagamento mobile e sportelli automatici;
• **Agricoltura** - formazione degli agricoltori e applicazioni mobili per diffondere informazioni sulle pratiche agricole;
• **Mezzi di sussistenza** - apicoltura, eco-turismo comunitario, imprese locali da parte delle donne, e iniziative imprenditoriali della gioventù rurale.

Tematiche affrontate:

- Migliorare l'accesso all'acqua potabile, alla luce elettrica e alle infrastrutture di trasporto;
- Fornire servizi sanitari di qualità e servizi educativi;
- Promuovere lo sviluppo economico e l'imprenditorialità;
- Proteggere l'ambiente e promuovere la sostenibilità;
- Migliorare la governance e la partecipazione dei cittadini.

*TNN (Times of India), (2015, September 16). Microsoft picks Melghat village Harisal under Digital India plan. Retrieved from https://timesofindia.indiatimes.com/city/nagpur/microsoft-picks-melghat-village-harisal-under-digital-india-plan/articleshow/48977311.cms



Jefferson in Iowa

Jefferson è un villaggio ricco di storia e cultura. Il centro storico è caratterizzato da edifici storici del XIX secolo, tra cui il Jefferson County Courthouse, il Jefferson Hotel e la Jefferson Public Library. Il villaggio ospita anche una serie di musei, tra cui il Jefferson County Museum, il Jefferson Historical Society Museum e il Jefferson Arts Guild.
Jefferson ospita anche una serie di eventi culturali, tra cui il Jefferson Arts Festival, il Jefferson County Fair e il Jefferson Christmas Parade. Il villaggio è anche sede di una serie di gruppi teatrali e musicali, tra cui il Jefferson Community Theatre e il Jefferson Symphony Orchestra.
La popolazione era di 4.136 persone al censimento del 2010. La popolazione di Jefferson, Iowa, al censimento del 2020 era di 4.365 persone.

Smart Village Jefferson

Installazione di turbine eoliche e pannelli solari per generare energia pulita.
Utilizzo di batterie per immagazzinare l'energia generata da fonti rinnovabili, in modo da poterla utilizzare anche di notte o quando il vento non soffia.
Implementazione di programmi di efficienza energetica per ridurre il consumo di energia negli edifici pubblici e privati.

- **Sensori:** i sensori sono stati utilizzati per monitorare le condizioni del suolo e dell'acqua, per monitorare il traffico, per identificare potenziali problemi di sicurezza e per monitorare la salute dei cittadini.
- **Software:** il software è stato utilizzato per analizzare i dati raccolti dai sensori, per ottimizzare l'irrigazione, per gestire il traffico, per prevenire i crimini e per monitorare la salute dei cittadini.
- **Internet of Things (IoT):** l'IoT è stato utilizzato per collegare i sensori e il software, in modo da creare un sistema integrato che può essere utilizzato per migliorare la sostenibilità, l'efficienza, la sicurezza e la qualità della vita della città.

Dati geografici:

Stato: Iowa
Regione: Iowa centrale
Lingua: Inglese
Orario: Central Standard Time (UTC-6)
Altitudine: 327 metri s.l.m.

Dettagli del progetto e obiettivi:

Il progetto è stato finanziato da una serie di fonti, tra cui:

- Fondo di investimento pubblico e privato di Iowa
- Fondo di investimento della città di Jefferson
- Fondo di investimento della contea di Jefferson
- Fondo di investimento della Iowa Economic Development Authority
- Fondo di investimento del governo federale

Importo del progetto: 100 milioni di dollari
Numero di villaggi coinvolti: 10
Partners e Aziende: City of Jefferson, Tennessee Valley Authority, Google, Microsoft, Cisco, IBM, Intel, Oracle, SAP
Periodo del progetto: 5 anni
L'obiettivo del progetto è generare energia pulita con turbine eoliche e pannelli solari, immagazzinare l'energia, ridurre il consumo con programmi di efficienza, utilizzare sensori e software per monitorare e ottimizzare vari aspetti della città, e integrare tutto con l'IoT.

Tematiche affrontate:

- Energia;
- Sostenibilità;
- Agritech;
- Qualità della vita.

*Krueger, R., Vedogbeton, H., Fofana, M., & Soboyejo, W. (Eds.). (2023). Smart Villages: Generative Innovation for Livelihood Development (Integrated Global STEM). De Gruyter. ISBN 9783110786217

MORIPODU - INDIA

"Una comunità che dispone della tecnologia digitale e di piattaforme di innovazione aperta per accedere ai mercati globali".
Prof. Salomon Darwin

SMART VILLAGE MOVEMENT

Lo Smart Village Movement è nato e fondato presso l'UC Berkeley-HAAS Garwood Center for Growth Markets da Solomon Darwin in seguito alla tavola rotonda sull'innovazione del 2016 ospitata dal presidente Shri Pranab Mukherji a Nuova Delhi, in India. È stato questo forum a proporre l'idea dello Smart Village Movement attraverso un approccio all'innovazione aperta per potenziare il subcontinente e collegare le popolazioni rurali dell'India con l'ecosistema Industria 4.0 per migliorare la loro partecipazione e il loro benessere. Darwin trae ispirazione dal sentimento espresso dal Mahatma Gandhi secondo cui "L'anima dell'India vive nei suoi villaggi". La sua consapevolezza della situazione di vita gravemente debilitante nel suo villaggio di Moripodu, dove è cresciuto, ha trovato l'allineamento con la necessità dell'ex Primo Ministro Chandra Babu Naidu dell'Andhra Pradesh di migliorare la situazione nei suoi collegi elettorali rurali. Il Berkeley Open Innovation Approach to Smart Villages è stato sponsorizzato e adottato per la prima volta dall'Andhra Pradesh nell'estate del 2016. Il ritorno di Darwin alle sue radici è stato un evento fortuito per Moripodu: si è trasformato da comunità rurale in difficoltà nel primo Smart Village al mondo.

Moripodu Village

Questo primo prototipo di Smart Village ha convalidato due aspetti fondamentali:

- La disponibilità degli abitanti del villaggio ad abbracciare la tecnologia digitale per potenziare se stessi, migliorando così la qualità della loro vita quotidiana e favorendo l'inclusione digitale.
- La disponibilità delle aziende tecnologiche globali e di altri partner aziendali a investire nella prototipazione di nuovi modelli di business in India, creando un ecosistema collaborativo che promuove l'innovazione e lo sviluppo sostenibile nelle aree rurali.

Il successo di SVM a Moripodu ha dimostrato come le tecnologie digitali possano effettivamente migliorare la vita delle popolazioni rurali, offrendo loro nuove opportunità di crescita economica e sociale. Lo Smart Village Movement è stato istituito come modello da seguire e ampliato in tutto l'Andhra Pradesh, nello stato nord-orientale dell'Arunachal Pradesh, e ora è attivamente in corso anche in Meghalaya. Questo movimento ha aperto la strada a ulteriori iniziative di sviluppo tecnologico nelle aree rurali, mostrando come l'adozione di tecnologie avanzate possa essere un motore di trasformazione per le comunità rurali, migliorando la loro resilienza e sostenibilità a lungo termine.

Dati geografici:

Località: Moripodu
Nome Mandal: Sakhinetipalle
Distretto: East Godavari
Stato: Andhra Pradesh
Regione: Andhra
Lingua: Telugu
Orario: IST (UTC+5:30)
Altitudine: 15 metri s.l.m.

Aree di impatto del movimento Smart Village
Area del Programma Pilota Attivo con Progetti SVM in corso
Area inattiva con programma pilota precedentemente completato o programma SVM di prossima apertura

Dettagli del progetto e obiettivi:

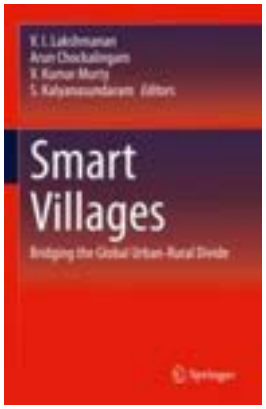
Importo del progetto: 5.000.000.000 €
Numero di villaggi coinvolti: 650.000
Partners e Aziende: 90
Periodo del progetto: 2016 - oggi
Obiettivi: Miglioramento della qualità della vita nelle aree rurali attraverso l'integrazione tecnologica e creazione di un ecosistema collaborativo tra comunità locali e aziende tecnologiche globali

FONDATORE: Professor Solomon Darwin
Father of the Smart Village Movement
Director, Garwood Center for Corporate Innovation
Executive Director, Center for Growth Markets

Tematiche affrontate:

- Agricoltura;
- Assistenza sanitaria;
- Famiglia e Educazione;
- Connettività;
- Energia;
- Acqua;
- Sanificazione.

*Darwin, S. (2018). The Road to Mori: Smart Villages of Tomorrow (Paperback). ISBN 978-1732135390.



CLIMATE SMART VILLAGE IN AMERICA LATINA

Questo progetto aiuta l'implementazione di tecnologie e pratiche di agricoltura intelligente per il clima e l'attuazione di strategie di coinvolgimento della comunità. Garantisce che l'attuazione venga eseguita attraverso approcci partecipativi e crea prove per supportare l'aumento e l'eliminazione della CSA attraverso le parti interessate nazionali e regionali. Ad esempio, alcune delle attività includono l'implementazione di studi di riferimento, il coinvolgimento con le parti interessate a livello locale e lo sviluppo di servizi agroclimatici specifici del contesto per ogni Climate-Smart Village (CSV) in America Latina utilizzando le tecnologie dell'informazione e della comunicazione agroclimatiche. L'obiettivo di questa ricerca è che gli agricoltori organizzati e le comunità indigene di Cauca (Colombia) raggiungano una sicurezza alimentare sostenibile per se stessi e le loro famiglie costruendo piani di adattamento locali e adottando pratiche e tecnologie CSA. Inoltre, la ricerca mira a consentire agli agricoltori di Tuma La Dalia (Nicaragua) e Trifinio (Guatemala e Honduras) di implementare opzioni CSA compreso l'uso di alternative come l'agroforestazione e i servizi agroclimatici. Il successo dei CSV viene utilizzato come prova per attuare piani di adattamento locali in altri villaggi.

Olopa Smart Village

Nel 2014, CCAFS Latin America ha istituito un CSV a Olopa, Chiquimula, Guatemala. Qui, CCAFS, insieme al suo partner locale, l'Asociación Regional Campesina Ch'orti' (ASORECH), coordina l'attuazione dell'approccio CSV. Anche altri attori locali sono direttamente coinvolti nell'attuazione. Ad esempio, durante una recente visita, è diventato chiaro che un gruppo di donne della comunità di La Prensa sta guidando l'implementazione delle opzioni CSA all'interno della comunità. La motivazione del loro coinvolgimento è che le opzioni CSA aiutano le donne locali ad aumentare la produttività delle loro colture e migliorare la loro sicurezza alimentare. In questo modo, possono migliorare i propri mezzi di sussistenza e contemporaneamente adattarsi ai cambiamenti climatici. Raccolte in una sala comune, le donne de La Prensa hanno potuto comprendere come concetti come "probabilità", "temperatura", "clima" e "tempo" sono legati alle loro colture e hanno approfondito le loro conoscenze durante il primo workshop sul Partecipativo Metodologia dei servizi climatici integrati per l'agricoltura (PICSA).

Dati geografici:

Località: Olopa
Distretto: Dipartimento di Chiquimula
Stato: Guatemala
Lingua: Spagnolo
Orario: GMT-6
Altitudine: 1.500 metri s.l.m.

Dettagli del progetto e obiettivi:

Partners e Aziende: CCAFS Latin America Team, Centro internazionale per l'agricoltura tropicale (CIAT), Asociación Regional Campesina Ch'orti' (ASORECH), Comisión de Acción Social Menonita (CASM), Fundación EcoHábitats e Fundación Procuenca Rio Las Piedras.
Periodo del progetto: 2014 - oggi

- Implementare opzioni di agricoltura sostenibile (CSA) per migliorare la resa agricola delle colture locali.
- Assicurare che le famiglie locali abbiano accesso a cibo nutriente attraverso pratiche agricole più efficienti e sostenibili.
- Educare e fornire strumenti alle comunità locali per affrontare e adattarsi agli effetti del cambiamento climatico sulle pratiche agricole.
- Migliorare le condizioni economiche e sociali delle famiglie locali.
- Educare le comunità locali, in particolare le donne, sui concetti di clima, tempo e probabilità, e su come questi fattori influenzano l'agricoltura, attraverso workshop e metodologie partecipative come il PICSA.

TEMATICHE AFFRONTATE:

- Piani di adattamento locale equi alla variabilità climatica;
- Materiali di informazione agroclimatica;
- Analisi di genere delle comunità e strategie di intervento;
- Documentazione sull'esperienza di integrazione di saperi antichi;
- Sviluppo di un miglioramento dei sistemi partecipativi di allerta precoce;
- Elaborazione di linee guida e raccomandazioni di pianificazione per supportare la formulazione delle politiche a livello nazionale.

*Lakshmanan, V. I., Chockalingam, A., Murty, V. K., & Kalyanasundaram, S. (Eds.). (2022). Smart Villages: Bridging the Global Urban-Rural Divide (1st ed.). Springer Cham. https://doi.org/10.1007/978-3-030-68458-7

QINGYANLIU - CINA

CHINA

Le autorità cinesi hanno emesso una circolare riguardante un progetto pilota sui villaggi digitali, con l'obiettivo di introdurre tecnologie digitali nelle aree rurali per promuovere la modernizzazione. Sette dipartimenti, tra cui l'Amministrazione cinese del cyberspazio e il Ministero dell'agricoltura, hanno collaborato per emettere la circolare.
Il progetto prevede la creazione di "villaggi digitali", il potenziamento dell'infrastruttura tecnologica nelle aree rurali, nuovi modelli per l'economia digitale e la governance rurale. L'obiettivo è ridurre il divario digitale tra città e campagna, favorendo lo sviluppo economico nei villaggi pilota entro il 2021.
La circolare promuove l'uso della fibra ottica, dell'Internet mobile e di altre tecnologie nelle zone rurali. È stata anche pubblicata una guida che incoraggia l'adozione di tecnologie come big data e intelligenza artificiale nell'agricoltura, nella formazione professionale e nella costruzione di nuove infrastrutture. Inoltre, la guida supporta il commercio elettronico nelle aree rurali e l'uso delle tecnologie digitali per promuovere la finanza inclusiva.
In sintesi, le autorità cinesi stanno promuovendo l'adozione di tecnologie digitali nelle zone rurali attraverso un progetto pilota e una guida, con l'obiettivo di modernizzare l'agricoltura e le aree rurali in generale.

Villaggi digitali in China

Il "Rapporto sullo sviluppo dei villaggi digitali in Cina" del 2022 è stato recentemente pubblicato. Il Centro informazioni del Ministero dell'agricoltura e degli affari rurali ha guidato la compilazione del rapporto con la collaborazione dell'Ufficio per lo sviluppo dell'informatizzazione dell'Ufficio della Commissione centrale per gli affari del cyberspazio e del Dipartimento del mercato e dell'informatizzazione del MARA. Il rapporto offre una panoramica dettagliata dei progressi e dei risultati in otto settori nello sviluppo dei villaggi digitali dal 2021. Questi settori includono l'infrastruttura digitale rurale, l'agricoltura intelligente, nuovi modelli di agroalimentare, la governance digitale rurale, la cybercultura rurale, servizi pubblici digitalizzati, villaggi verdi intelligenti e l'ambiente di sviluppo del villaggio digitale. Valuta anche per la prima volta il grado di sviluppo dei villaggi digitali in diverse regioni, con l'obiettivo di fornire riferimenti per promotori, professionisti e ricercatori nello sviluppo dei villaggi digitali. Nel complesso, si è accelerata la costruzione delle infrastrutture digitali nelle aree rurali negli ultimi anni. Entro la fine del 2022, tutte le aree urbane a livello di contea erano coperte da rete 5G e ogni villaggio aveva accesso alla banda larga. Nuove forme di agroindustria e il commercio elettronico rurale hanno raggiunto 2,17 trilioni di RMB.

Dati geografici:

Località: Qingyanliu
Stato: China
Regione: Zhejiang
Lingua: Cinese
Orario: IST (UTC+5:30)
Altitudine: 15 metri s.l.m.

Dettagli del progetto e obiettivi:

Secondo i risultati della valutazione del 2022 sullo sviluppo dei villaggi digitali: 1) l'agricoltura intelligente ha registrato una crescita rapida, con un tasso di informatizzazione della produzione agricola salito al 25,4%; 2) l'efficienza della governance digitale rurale è migliorata costantemente, con il 68,2% dei servizi governativi legati all'agricoltura gestiti online a livello nazionale; 3) i servizi pubblici digitalizzati sono stati promossi in modo costante, con 483.000 uffici di servizio a livello di villaggio che utilizzano la tecnologia digitale e l'86,0% dei villaggi amministrativi che avevano accesso ai servizi pubblici digitalizzati.

Numero di villaggi coinvolti: tutti i villaggi rurali cinesi
Periodo del progetto: 2023

FONDATORE: Ministro dell'agricoltura e degli affari rurali della Repubblica Popolare Cinese

Tematiche affrontate:

- Digitale;
- E-Commerce;
- Rural divide.

*Jiang Zhi Rong & Zhu Bian. (2000). China's top ten village in Xiaogang Village of Anhui. Zhejiang Garden Village. Lanzhou University Press. ISBN 7311033977/ ISBN 9787311033972

Saathi

Saathi è un villaggio situato nel distretto di Pune, nello stato del Maharashtra, in India. Con una popolazione di circa 1.500 abitanti, la maggior parte dei quali sono agricoltori, il villaggio ha affrontato a lungo condizioni di povertà e mancanza di infrastrutture di base. Le case sono spesso costruite con materiali semplici, le strutture sanitarie sono carenti e le scuole sono mal attrezzate.
Nel 2018, Saathi è stato selezionato per partecipare al progetto "Smart Village" del governo del Maharashtra. Questo progetto ha portato significativi miglioramenti al villaggio. L'accesso all'acqua potabile è stato garantito con nuovi sistemi di distribuzione, mentre l'elettricità è diventata più stabile e accessibile a tutte le famiglie. Le infrastrutture di trasporto sono state migliorate con la costruzione e l'aggiornamento delle strade, facilitando il movimento di persone e beni.
Il progetto ha inoltre fornito servizi sanitari di qualità attraverso la costruzione di nuovi centri sanitari e il miglioramento di quelli esistenti, dotandoli di personale medico qualificato. Anche il settore educativo ha beneficiato di questo progetto, con la costruzione e il miglioramento delle scuole, l'introduzione di programmi educativi moderni e la formazione di insegnanti qualificati.

Lo Smart Village di Saathi

Nel 2015, solo 1 utente Internet su 10 nell'India rurale era una donna.
Tata Trusts e Google si sono uniti per affrontare questo enorme divario di genere e hanno introdotto un programma di alfabetizzazione digitale, basato sul modello "train the trainer".
Le donne dei villaggi vengono addestrate all'uso di Internet e dotate di dispositivi abilitati ai dati.
Queste donne sono conosciute come Internet Saathis e lavorano come formatori, per aiutare altre donne nel loro villaggio a iniziare il loro viaggio in Internet e trarne vantaggio.
Ad aprile 2019, ci sono più di 81.500 Internet Saathis che hanno aiutato oltre 28 milioni di donne a conoscere Internet in 289.000 villaggi.
L'introduzione del programma Internet Saathi nei villaggi ha creato una rivoluzione silenziosa soprattutto per le donne.
Il facile accesso a semplici informazioni su assistenza sanitaria, agricoltura, competenze, programmi governativi ha cambiato rapidamente le loro vite.

Dati geografici:

Stato: India
Lingua: Hindi
Orario: GMT+5:30
Altitudine: 3.000 metri s.l.m.
Posizione: 27.01 N, 87.93 E
Numero donne coinvolte: 28 milioni di donne
Numero di villaggi coinvolti: 289.000
Numero di stati coinvolti: 20

SMART VILLAGE

Partners e aziende: Google e Tata Trust
Periodo del progetto: 2015 - oggi
Lanciato nel 2015 da Google e Tata Trusts, mira a responsabilizzare digitalmente e creare opportunità di sostentamento per le donne rurali fornendo formazione sulle competenze digitali. L'iniziativa utilizza un approccio "formare il formatore", la formazione delle donne rurali "saathis" sull'utilizzo di Internet, che poi formare altre donne nei loro villaggi. Questi i partner locali addestrano le donne rurali ad utilizzare smartphone o tablet per accedere a Internet e trovare informazioni su agricoltura, istruzione, salute, opportunità di lavoro e finanziamenti. Ogni Saathi poi forma le donne in almeno quattro villaggi nelle sue vicinanze, ricevendo uno stipendio mensile, biciclette per il pendolarismo, e voiceenabled tablet e smartphone per aiutare a fare questo. L'iniziativa Internet Saathi è finanziata da una sovvenzione di circa 10 milioni di USD e ha formato più di 815.000 Saathis, che a loro volta hanno raggiunto 28 milioni di donne in 289.000 villaggi.31 43.000 donne hanno ricevuto opportunità di sostentamento attraverso FREND, generando entrate per 1,5 milioni di dollari.

TEMATICHE AFFRONTATE:

- Alfabetizzazione digitale per il sostentamento delle donne rurali;
- Digital Divide;
- Sviluppo rurale.

*Bathija, M. (2018, August 7). Internet Saathi: Improving digital literacy among women. Forbes India. Retrieved from https://www.forbesindia.com/article/future-of-work/internet-saathi-improving-digital-literacy-among-women/50951/1

SANDAKPUR - NEPAL

Il contesto: Sandakpur

Sandakpur, un piccolo villaggio nel Nepal centrale, ha ricevuto una nuova scuola grazie a una donazione da parte di un'organizzazione umanitaria locale. La scuola, che ha una capacità di 100 studenti, è stata costruita in cemento e mattoni e dispone di aule, bagni, una cucina e un pozzo. La nuova scuola consentirà ai bambini di Sandakpur di ricevere un'istruzione di qualità e di avere una migliore opportunità di successo nella vita. Il 25 aprile 2015, il Nepal è stato colpito da un terremoto di magnitudo 7,8. Il terremoto ha causato ingenti danni a Sandakpur, distruggendo molte case e scuole. La popolazione del villaggio è stata costretta a vivere in rifugi di fortuna per mesi. Grazie agli aiuti umanitari, la popolazione di Sandakpur ha iniziato a ricostruire le proprie case e le proprie scuole. Il terremoto ha però lasciato un segno profondo nella comunità di Sandakpur, che sta ancora lottando per riprendersi dalla tragedia.
Il villaggio è situato in una zona montuosa ed è spesso colpito da inondazioni e frane. La popolazione di Sandakpur ha iniziato a costruire dighe e canali per deviare le acque delle piogge e per prevenire le inondazioni. La comunità di Sandakpur è anche impegnata a piantare alberi per prevenire le frane.

SMART VILLAGE

Uno smart village nella regione collinare del Nepal all'interno di Maipokhari e Sulubung villaggio di Sandakpur rurale, nella parte orientale del Nepal. Confina con l'India e ha anche luoghi turistici molto famosi, ma manca di infrastrutture di base. Sfrutta le caratteristiche intelligenti delle risorse, Smart Living, Smart Governance, Smart Village Services, Smart Technology, Smart Tourism, Gender Equity e Donne Equità che può soddisfare alcuni degli obiettivi di sviluppo sostenibile delle Nazioni Unite. La scala Likert a cinque punti è stata utilizzata per classificare la funzione Smart Village e il Who-Square test è fatto per determinare la significatività delle opinioni del rispondente per le variabili dai dati raccolti. L'utilizzo intelligente delle risorse è la chiave per un paese sostenibile, utilizzando calcolatrici biologiche, calcolatrici ecologiche si cerca un equilibrio tra consumo e produzione di risorse. Durante l'indagine del questionario, è emerso che le persone qui sono per lo più dipendenti dalle risorse naturali, dall'agricoltura, dalle erbe medicinali e dal bestiame. I turisti sono attratti qui a causa dell'ambiente piacevole e bellezze naturali. Anche se l'agricoltura è l'occupazione di base e possiede un potenziale per l'industria delle erbe medicinali, le persone non hanno la loro terra e non ci sono servizi base come acqua potabile pulita, irrigazione, e anche servizi basati sulle TIC.

Dati geografici:

Località: Sandakpur Rural Municipality
Stato: Ilam Distretto di Provincia No. 1 Nepal
Superficie: 48,86 mq. km (Ward -1 e 3)
Stato: Nepal
Lingua: Nepalese
Orario: UTC +5:45
Altitudine: 3.000 metri s.l.m.
Posizione: 27.01 N, 87.93 E
Numero di abitanti: 1374

Dettagli del progetto e obiettivi:

Importo del progetto: 107 milioni di dollari
Numero di villaggi coinvolti: 2.111
Partners e aziende: CCAFS South Asia Regional Program
Partners: Nepal Agricultural Research Council (NARC), Ministry of Agricultural Development, Nepal (MOAD), Local Initiatives for Biodiversity, Research and Development (LI-BIRD), Agriculture and Forestry University, Nepal (AFU)
Periodo del progetto: 2015 - oggi

- Caratteristiche domestiche
- Sfruttamento del suolo e agricoltura
- Infrastrutture sociali
- Economia
- Governance and Servizi pubblici
- Questioni di interesse ambientale
- Accesso and Uso delle infrastrutture ICT

Tematiche affrontate:

- Vita intelligente;
- Governance intelligente;
- Villaggio intelligente;
- Servizi intelligenti;
- Tecnologia intelligente;
- Turismo intelligente;
- Equità di genere;
- Equità per le donne.

*Mishra, A.K. and Pokharel, Rajat, (2023) Economic Feasibility Assessment of Smart Village Project: A Case of Sandakpur Rural Municipality, Ilam, Nepal https://dx.doi.org/10.46679/9788195732203, Available at SSRN: https://ssrn.com/abstract=4400542

Smart village

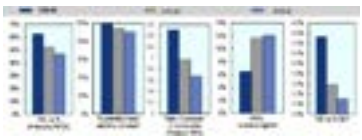
L'approccio coreano è stato fortemente influenzato dall'esperienza dell'Unione Europea (UE) che ha sottolineato l'importanza di uno sviluppo territoriale dal basso verso l'alto. Il governo coreano riconosce che l'agricoltura non è l'unico motore dell'occupazione rurale e della creazione di ricchezza. Comprende piuttosto che le attività non agricole diversificate nelle aree rurali sono essenziali per rivitalizzare l'economia rurale. Le principali politiche rilevanti per lo sviluppo del villaggio rurale intelligente sono in primo luogo, la creazione di un sistema di innovazione regionale adatto alle regioni depresse, in secondo luogo, l'induzione dell'agricoltura a diventare industrie a valore aggiunto, in terzo luogo, la diversificazione delle attività economiche rurali e l'integrazione del sostegno industriale, in quarto luogo, il miglioramento del benessere dei residenti rurali migliorando le condizioni di insediamento e, infine, incoraggiando l'interazione rurale-urbana. Poiché la campagna del villaggio rurale intelligente come strategia di sviluppo rurale è strettamente correlata alla discussione sul turismo rurale in Corea, lo studio esamina i flussi passati e recenti delle strategie di turismo rurale perseguite dal governo centrale in Corea.

Smart Farm Innovation Valleys in Corea

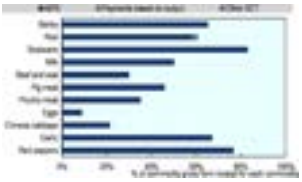
La transizione verso l'agricoltura digitale in Corea del Sud è inevitabile poiché ha dovuto far fronte al rapido restringimento delle comunità rurali. Circa il 46% della popolazione delle famiglie agricole ha più di 65 anni e questo indica non solo l'invecchiamento della popolazione stessa, ma anche il possibile rischio per la sicurezza alimentare. Il cambiamento climatico è anche una delle principali sfide che il settore agricolo sta affrontando mentre ha minacciato la produzione stabile dei raccolti e rende difficile per gli agricoltori prevedere e affrontare i disastri meteorologici. La Corea del Sud è ben nota come leader delle tecnologie dell'informazione e della comunicazione in quanto si è classificata tra i primi tre dell'indice di sviluppo delle tecnologie dell'informazione e della comunicazione (ICT) (IDI) dell'ITU negli ultimi cinque anni. L'invenzione e la diffusione di nuove pratiche di agricoltura digitale sarà la nuova strategia per la Corea del Sud per superare la crisi causata dall'invecchiamento della popolazione e dal cambiamento climatico. Il progetto Smart Farm Innovation Valleys è stato lanciato dal Ministero dell'Agricoltura, dell'Alimentazione e degli Affari Rurali della Corea (MAFRA) nel 2019. Il progetto ha lo scopo di creare quattro Smart Farm Innovation Valleys in tutto il paese, ognuna delle quali ospiterà una varietà di strutture e servizi per supportare la pratica dell'agricoltura intelligente.

Dati geografici:

Località: Korea del Sud
Stato: Asia orientale
Lingua: Coreano
Orario: GMT+9
Altitudine: 440 metri s.l.m.
Posizione: 33° 0' 14.76" N; 131° 9' 37.08" E



Korea: Development of support to agriculture & Transfer to specific commodities (SCT), 2018-20



Dettagli del progetto e obiettivi:

Periodo del progetto: 2021 - oggi
Gli **obiettivi** del progetto Smart Farm Innovation Valleys sono i seguenti:

- Promuovere l'adozione di tecnologie di agricoltura intelligente da parte dei giovani agricoltori.
- Sviluppare nuove tecnologie e pratiche per l'agricoltura intelligente.
- Aumentare la produttività e la qualità dei prodotti agricoli.
- Migliorare la sostenibilità dell'agricoltura.
- Attrarre investimenti privati nell'agricoltura intelligente.

Il progetto Smart Farm Innovation Valleys ha già avuto un impatto positivo sull'agricoltura in Corea. Ad esempio, il progetto ha contribuito a ridurre i costi di produzione, migliorare la qualità dei prodotti agricoli e aumentare la produttività. Inoltre, il progetto ha contribuito a creare nuovi posti di lavoro nel settore agricolo. Il progetto Smart Farm Innovation Valleys è ancora in corso, ma ha già dimostrato il suo potenziale per trasformare il settore agricolo in Corea. Il progetto è destinato a continuare a migliorare l'agricoltura in Corea, rendendola più efficiente, sostenibile e redditizia.

Tematiche affrontate:

- ICT;
- Smartfarm.

*Visvizi, A., Lytras, M. D., & Mudri, G. (Eds.). (2019). Smart Villages in the EU and Beyond. Emerald Publishing Limited. DOI: 10.1108/9781787698451

UCHUNJU - AZERBAIJAN

Uchunju Aghali

Uchunju Aghali è un villaggio del distretto di Fuzuli, nella Repubblica dell'Azerbaigian. Il villaggio ha una popolazione di circa 500 abitanti.
Gli abitanti di Uchunju Aghali sono per lo più agricoltori. Il villaggio è povero e manca di infrastrutture di base. Nel 2020, il villaggio è stato completamente distrutto durante la guerra del Nagorno Karabakh. Nel 2021, il villaggio è stato ricostruito dal governo dell'Azerbaigian. Il governo azerbaigiano ha esplorato provvisoriamente l'idea prima della guerra: un programma statale di sviluppo socio-economico delle regioni della Repubblica dell'Azerbaigian 2019-2023 richiedeva la creazione di due "villaggi intelligenti" pilota. L'idea ha preso slancio dopo la guerra dello scorso anno, in cui l'Azerbaigian ha riconquistato più di 8.000 chilometri quadrati di territorio dentro e intorno al Nagorno-Karabakh, circa il 75 per cento della terra che aveva perso a causa delle forze armene nella prima guerra degli anni '90. Più di 600.000 azeri furono sfollati in quella guerra; molti di quelli ora sperano di tornare. Il primo progetto di villaggio intelligente è stato realizzato a Uchunju Aghali, nel distretto di Zangilan, con un'agricoltura basata su "tecnologie moderne e gestione e controllo congiunti". Il governo investirà 1,3 miliardi di dollari per costruire "città e villaggi intelligenti".

Smart Village Uchunju Aghali

Il primo progetto di "villaggio intelligente" sarà realizzato nel distretto di Zangilan. Il progetto viene lanciato oggi. Sono già stati condotti studi preliminari. Questo è il villaggio distrutto di Aghali. Questo è il primo villaggio ad essere restaurato. Il Presidente è stato informato del progetto di "villaggio intelligente" da realizzare nel villaggio di Uchunju Aghali nel distretto di Zangilan. Il progetto sarà realizzato nel villaggio su un totale di cinque componenti. Si tratta di alloggi, produzione, servizi sociali, "agricoltura intelligente" ed energie alternative. Il presidente Ilham Aliyev ha ripetutamente affermato nei suoi discorsi che i territori liberati diventeranno una zona di "energia verde". Ci sono piani non solo per restaurare e ricostruire i territori liberati dall'occupazione armena su iniziativa diretta e istruzioni del Presidente, ma anche per implementare i concetti di "città intelligente" e "villaggio intelligente". In un momento in cui l'economia mondiale sta attraversando grandi problemi a causa della pandemia, questa iniziativa del Presidente dell'Azerbaigian dimostra ancora una volta la forza e il potere dello Stato. Il fabbisogno energetico del futuro villaggio di 200 case sarà fornito utilizzando fonti di energia alternative.

Dati geografici:

Località: Uchunju Aghali
Distretto: Zagilan
Stato: Azerbaigian
Lingua: Azera
Orario: GMT+4
Altitudine: -30 / 5.239 s.l.m.
Numero di abitanti: 110

Obiettivi:

Importo del progetto: 1.300.000.000 €
Periodo del progetto: 2021 - oggi
Obiettivi del progetto sono:

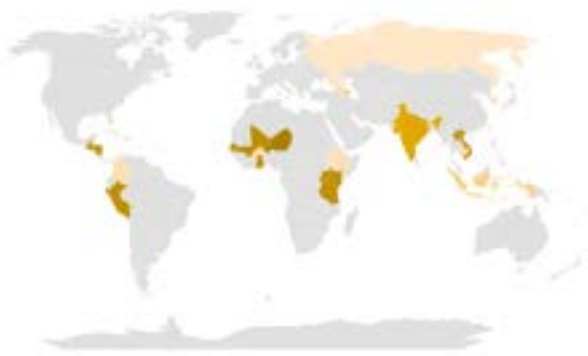
- Ricostruire le abitazioni distrutte e fornire alloggi moderni e sostenibili per i residenti, utilizzando tecnologie avanzate per migliorare la qualità della vita.
- Implementare modelli di produzione innovativi che stimolino l'economia locale, creando posti di lavoro e aumentando la produttività.
- Migliorare l'accesso ai servizi sociali, come l'istruzione e la sanità, attraverso l'uso di tecnologie intelligenti e soluzioni digitali.
- Promuovere pratiche di agricoltura intelligente per aumentare l'efficienza e la sostenibilità della produzione agricola, riducendo l'impatto ambientale.
- Sostenere il fabbisogno energetico del villaggio di 200 case utilizzando fonti di energia alternative, in linea con la visione del Presidente di creare una zona di "energia verde".

Tematiche affrontate:

- Social housing;
- Produzione;
- Servizi sociali;
- Agricoltura intelligente;
- Energia alternativa.

*World Bank. 2021. Smart Villages in Azerbaijan: A Framework for Analysis and Roadmap. © World Bank.

SOMMARIO ANALISI SMART VILLAGES EXTRAEUROPEI



Elenco dei villaggi extraeuroperi analizzati e delle tematiche maggiormente trattate

SMART VILLAGES EXTRAEUROPEI			
N°	**Localizzazione**	**Smart Village**	**Tematica**
1	Niger	*Smart Village Blueprint*	Capacity building
			Digital transformation
			Digital infrastructure
			Broadband
			Connectivity
			Digital divide and skills
			ITU-D
			ICTs
2	Nepal	*Sandakpur Smart Village*	Smart living
			Smart governance
			Smart services
			Smart technology
			Smart tourism
			Gender equity
			Women equiti
3	India	*Moripodu Village*	Agricoltura
			Educazione
			Assistenza sanitaria • Famiglia
			Connettività
			Energia
			Acqua
			Sanificazione
4		*Saathi Smart Village*	Alfabetizzazione digitale per il sostentamento delle donne rurali
5		*Harisal de Maharashtra*	Connettività digitale
			Sanità
			Istruzione e formazione
			Governance
			Servizi finanziari digitali
			Agricoltura
			Mezzi di sussistenza
6	Azerbaijan	*Uchunju Aghali*	Social housing
			Produzione
			Servizi sociali
			Agricoltura intelligente
			Energia alternativa
7	Indonesia	*Banjuwangy Regency*	Risorse umane
			Governance
			Socializzazione
8	Corea	*Smart Farm Innovation Valleys*	ICTs
9	Russia	*Tatarzan*	Commercial Network
			Leadet LTE
			More popolation
			World leader of PCs
10	Colombia	*CGIAR*	Smart agricolture
11	El Salvador		
12	Guatemala		Rural e-commerce
13	Honduras		
14	Nicaragua		
15	Perù		Shared vegetable garden
16	Ethiopia		
17	Kenya		
18	Tanzania		
19	Uganda		Smart village doctor healt
20	Burkina Faso		
21	Ghana		
22	Mali		ICTs
23	Niger		
24	Senegal		
25	Cambodia		Poverty alleviation
26	Lao PDR		
27	Vietnam		

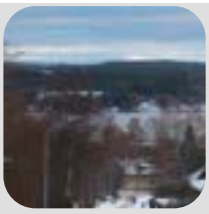
Statistica delle tematiche maggiormente trattate

Il grafico sui Smart Villages in contesti extraeuropei evidenzia chiaramente come la digitalizzazione sia la tematica predominante. In questi villaggi, situati in contesti socioeconomici fragili, la digitalizzazione rappresenta la chiave per lo sviluppo futuro, costituendo la base per favorire la diffusione delle informazioni e aprire nuove opportunità per le comunità. Questa componente centrale ha un impatto significativo sull'organizzazione territoriale e sulla gestione delle risorse, fungendo da catalizzatore per le altre categorie.
Successivamente, emergono altri ambiti strategici quali l'agricoltura, che assume un ruolo cruciale nel garantire la sostenibilità alimentare e lo sviluppo economico locale, soprattutto in contesti caratterizzati da una forte dipendenza dalle risorse agricole. Anche l'istruzione risulta essenziale, poiché è strettamente collegata alla digitalizzazione e contribuisce a migliorare le competenze della popolazione locale, aumentando la capacità di gestione autonoma delle risorse.
Le infrastrutture, necessarie per il corretto funzionamento dei villaggi, si collocano tra i temi centrali, insieme alla governance, che rappresenta la capacità di autogestione e la creazione di reti collaborative con enti e organizzazioni esterne. L'energia, infine, sebbene non rivesta un ruolo prioritario nei progetti, è una tematica importante per garantire la sostenibilità a lungo termine, soprattutto in termini di accesso a fonti rinnovabili. Riflette un percorso di sviluppo che parte dalla digitalizzazione come tema dominante, seguita dalle altre aree strategiche che facilitano l'autosufficienza e il miglioramento della qualità della vita nei villaggi extraeuropei.

Smart Villages Europei

SMART VILLAGES EUROPEI

1. ALSUNGA
[LETTONIA]



7. RAUDANMAA
[FINLANDIA]

2. ATENE
[GRECIA]

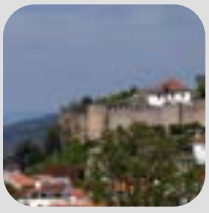
8. REMETEA
[ROMANIA]

3. KYTHIRA
[GRECIA]

9. SARAGOZA
[SPAGNA]

4. LAVANCOURT
[FRANCIA]

10. STANZ
[AUSTRIA]



5. PENELA
[PORTOGALLO]

11. TOMASZYN
[OLANDA]

6. PHINI
[CIPRO]

12. VUOLLERIM
[SVEZIA]

ALSUNGA - LETTONIA

Alsunga

Alsunga è uno dei due villaggi nel secondo comune più piccolo della Lettonia con 1 390 abitanti. La comunità locale è composta principalmente da persone con antiche tradizioni culturali, chiamate suiti. Lo Spazio Culturale Suiti è stato iscritto nella Lista UNESCO del Patrimonio Culturale Immateriale che necessita di urgente salvaguardia nel 2009. Alsunga è un buon posto dove vivere, ma il continuo spopolamento sta riducendo le risorse disponibili, modificando l'ambiente di vita e la necessità di servizi. Le priorità principali sono lo sviluppo di alimenti locali sostenibili e un mercato artigianale per aumentare i volumi di commercializzazione per i produttori domestici. Un'altra iniziativa è quella di sviluppare la scuola locale. Il comune di Alsunga sarà inglobato in un comune molto più grande e diventerà parrocchia di periferia. Ciò richiederà lo sviluppo di una forte strategia di villaggio e di un team per mantenere lo sviluppo di Alsunga. L'intera comunità trae vantaggio dalla cooperazione con residenti e imprenditori. Il villaggio intelligente è un processo piuttosto che uno stato statico. Si è quindi costituito lo "smart village action group" come associazione di volontariato che coinvolge sia i rappresentanti del Presidente del Consiglio Comunale, sia i rappresentanti delle ONG, i rappresentanti delle autorità locali e i residenti.

Alsunga Strategia

Obiettivo 1: Sviluppo di piccole imprese locali basate sul valore
Obiettivo 2: Stabilizzare il numero di persone nel villaggio

• Mercato settimanale (Suitu tirgus) di produttori e artigiani alimentari locali - molto visitato e popolare tra i residenti di altre regioni della Lettonia.
• Video sull'Alsunga Smart Village che promuove il territorio come destinazione turistica, apprezzare la storia culturale locale, le tradizioni e la produzione dei piccoli produttori locali e artigiani. (circa 55.000 visualizzazioni).
• Creare un ambiente più interessante ed esplorativo.
• Applicazione mobile per incoraggiare la cooperazione tra imprenditori del turismo.
• Strumenti di apprendimento in realtà aumentata o virtuale creati per l'ambiente scolastico locale.
• Spazio di co-working in cui diversi imprenditori indipendenti possono intraprendere le loro attività in a
ambiente comune condiviso.
• Nuovo prodotto turistico - evidenziare e sottolineare la storia culturale dell'area locale.

Dati geografici:

Località: Alsunga
Stato: Lettonia
Regione: Latvia
Lingua: Lettone
Orario: (EET), UTC +2
Altitudine: 200 metri s.l.m.
Numero di abitanti: 23.438

Dettagli del progetto e obiettivi:

Importo del progetto: 7.700.00 EUR0 €
Numero di villaggi coinvolti: 1
Periodo del progetto: Latvian National Development Plan 2014-2020 (hereinafter – NAP2020)

Gli obiettivi specifici dello Smart Village di Alsunga sono:

- Migliorare la qualità della vita dei residenti, creando un ambiente più sicuro, sano e sostenibile.
- Sviluppare un'economia locale più resiliente e competitiva.
- Creare un modello per lo sviluppo di altri villaggi intelligenti in Lituania e in altri paesi.

Tematiche affrontate:

- Digitalizzazione;
- Forti tradizioni culturali;
- Buon posto per vivere;
- Natura come risorsa;
- Buona collaborazione tra la comunità e il governo locale.

*Alsunga Smart Village Strategy. (2021). Smartrural21.eu. https://www.smartrural21.eu/villages/alsunga_lv/

ATENE - GRECIA

Atene

Atene, città nata dall'unificazione dei centri minori dell'Attica in epoca tardo micenea, ha occupato una posizione prestigiosa come capitale dell'Attica. Nella fase arcaica della sua storia, Atene ha sperimentato un governo monarchico, comune a molti altri centri urbani in Grecia. A partire dall'VIII secolo a.C., il potere assoluto dei monarchi di Atene ha ceduto il passo alle aristocrazie, con il governo affidato a magistrati eletti dalle classi dirigenti della città. Inizialmente, gli arconti avevano mandati decennali, ma nel corso del tempo questa carica si è trasformata in un organo collegiale composto da nove membri, con mandati annuali.I crescenti contrasti tra i contadini e l'aristocrazia fondiaria nel VII e VI secolo a.C. hanno reso necessaria una trasformazione verso forme politiche più inclusive. Nel 594 a.C., Solone, uno degli arconti, intervenne a favore dei piccoli contadini introducendo un sistema politico basato sulle classi di reddito, mirando a limitare il potere dell'aristocrazia. Tuttavia, le tensioni sociali non furono sopite, portando alla tirannide di Pisistrato nel 560 a.C. sotto la quale Atene conobbe un periodo di pace e prosperità. La tirannide di Pisistrato, sebbene inizialmente benefica, degenerò nel corso del VI secolo a.C. con il passaggio del potere ai suoi successori, riaccendendo i conflitti sociali all'interno della popolazione ateniese.

Electra Energy

ELECTRA ENERGY è un'organizzazione che lavora dal 2016 per la transizione verso un sistema energetico democratico, inclusivo, efficiente e sostenibile con al centro i cittadini e le comunità locali. La Grecia sta diventando un leader nella regione nella produzione di energia comunitaria grazie all'introduzione di nuovi quadri normativi nel 2018 che hanno implementato le legislazioni europee. Electra Energy, con sede ad Atene. La cooperativa, che promuove l'efficienza energetica e il risparmio attraverso campagne di sensibilizzazione, sviluppo di nuove partnership e reti locali, cerca di rimediare alla povertà energetica donando una parte della produzione alle famiglie che più ne hanno bisogno. Electra Energy vuole realizzare una centrale fotovoltaica solare nella regione di Corinto, che si baserà sul modello di "virtual-net-metering" comunitario. Significa che questo modello permetterà ai membri della comunità di acquistare una quota dell'installazione in base al proprio consumo e beneficiare della produzione solare, riducendo la bolletta annuale dell'elettricità. La centrale solare fornirà energia a oltre 130 case e piccole imprese, producendo 750.000 chilowattora di energia solare pulita all'anno per 25 anni, risparmiando complessivamente 7.500 tonnellate di emissioni di gas serra.

Dati geografici:

Località: Atene
Stato: Grecia
Lingua: Greco
Orario: (CET), UTC +1 (EEST)
Altitudine: 20 metri s.l.m.
Numero di abitanti: 4.013.368

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 città;
Periodo del progetto: 2018 - oggi

Obiettivi:

- Scuole pubbliche e fotovoltaico;
- By(e) Plastic Project;
- "Hyperion" Il primo investimento solare comunitario in Grecia, alimentato dai cittadini
- Guida per le comunità energetiche

Tematiche affrontate:

- Comunità energetica.

*Gjergji, O. (2023, April 28). Balcani: l'alternativa al carbone passa - anche - dalle Comunità energetiche. Osservatorio Balcani e Caucaso Transeuropa. https://www.balcanicaucaso.org/aree/Balcani/Balcani-l-alternativa-al-carbone-passa-anche-dalle-Comunita-energetiche-224890

Kythera

L'isola di Citera si trova all'incrocio di tre mari: lo Ionio, l'Egeo e il Mar di Creta. Citera è caratterizzata da un clima mediterraneo mite, umidità e forti venti, soprattutto in inverno. La frequente alternanza di paesaggi di quest'isola montuosa con numerose valli che portano al mare si traduce in molte belle spiagge. Ha un gran numero di insediamenti e una popolazione di 4 000 abitanti, i villaggi sono tanti e piccoli, sparsi in tutta la loro area geografica. L'isola è organizzata amministrativamente in un comune con la comunità di Antikythera, l'omonima isola vicina, sotto la provincia di Kythera, che appartiene alla regione dell'Attica. L'economia dell'isola si basa sulla vita rurale e sul turismo, mentre molti locali sono impiegati nei servizi, nel commercio e nelle organizzazioni pubbliche. L'invecchiamento della popolazione e l'emigrazione dei giovani per opportunità di istruzione e lavoro è una sfida importante per l'isola. A causa della sua posizione geografica, Citera non ha l'accesso ai mercati poiché la sua costa più vicina è a due ore di barca e incontra difficoltà quando i collegamenti di trasporto sono limitati. Il suo ambiente naturale unico è la sua risorsa più importante, la qualità della vita, la bellezza della natura, la società sensibilizzata, la terra fertile, i prodotti locali e riconosciuti e la storia dell'isola sono alcuni dei suoi principali vantaggi.

Alsunga Strategia

Nella strategia di Alsunga, si pone particolare attenzione alla valorizzazione della produzione locale, con un focus su prodotti come l'olio d'oliva, il miele e le piante aromatiche e medicinali.
Questo approccio non solo mira a promuovere e conservare i paesaggi, gli ecosistemi e la biodiversità di Citera, ma anche a sostenere il turismo di qualità attraverso forme alternative, valorizzando il patrimonio culturale, le bellezze naturali e i prodotti locali unici dell'isola.
La comunità locale, caratterizzata da una forte identità locale sostenuta da diverse associazioni e organizzazioni locali, partecipa attivamente al progetto Smart Rural 21.
L'obiettivo è quello di ottenere nuove idee e ispirazione per lo sviluppo di un piano strategico avanzato per l'implementazione di approcci innovativi di villaggio intelligente, contribuendo così alla crescita e al benessere sostenibile di Alsunga.

Dati geografici:

Località: Kythera
Stato: Grecia
Regione: Attica
Lingua: Greco
Orario: (EET), UTC +2
Altitudine: 200 metri s.l.m.
Numero di abitanti: 3.500

Dettagli del progetto e obiettivi:

Importo del progetto: 7.400.000 € budget
Numero di villaggi coinvolti: 8 comuni, 11 associazioni e gruppi;
Periodo del progetto: 2014 - 2020

Obiettivo 1: Sviluppo di piccole imprese locali basate sul valore;
Obiettivo 2: Stabilizzare il numero di persone nel villaggio;
Obiettivo 3: Mantenere i giovani sull'isola;
Obiettivo 4: Migliorare l'agricoltura e promuovere la produzione locale, nuove tecnologie in agricoltura e soluzioni di smart farming;
Obiettivo 5: Migliorare la sostenibilità ambientale;
Obiettivo 6: Sostenere le attività imprenditoriali;
Obiettivo 7: Aumentare il turismo di qualità. Sostenere forme alternative di turismo e promuovere l'area come destinazione turistica; Promuovilo come destinazione sicura grazie all'ospedale esistente.
Obiettivo 8: Migliorare i servizi (Trasporti, Istruzione e Sanità).

Tematiche affrontate:

- Rafforzare la cooperazione tra Comuni;
- Sviluppare strategie locali e regionali;
- Sostenere azioni di sviluppo locale.

*Kythera Smart Village Strategy. (2021). Smartrural21.eu. https://www.smartrural21.eu/wp-content/uploads/Kythera_Smart-Village-Strategy.pdf

LAVANCOURT - FRANCIA

Acces'R - ACCEssibility of ServiceS to the population in Rural areas

Access'R (Accessibilità dei servizi alla popolazione nelle aree rurali) è un progetto della durata di 3 anni.
È stato lanciato nel 2018 da Leader France, la Federazione nazionale dei territori rurali e 15 partner francesi ed europei, tutti impegnati nello sviluppo rurale europeo programma LEADER.
Questo progetto è stato sviluppato e realizzato nell'ambito del bando di mobilitazione collettiva per lo sviluppo rurale lanciato dalla Rete Rurale Nazionale.
Il suo scopo è identificare, promuovere e condividere buone pratiche e approcci innovativi volti a migliorare l'accessibilità, mantenere e rilanciare i servizi per la popolazione nelle aree rurali. L'immagine delle zone rurali è stata rafforzata dalla pandemia. Tuttavia, la conservazione e lo sviluppo dei servizi pubblici rappresentano ancora una sfida importante per questi territori rurali.
Dopo una prima raccolta di esperienze, pubblicata nel settembre 2020, Leader France e i suoi partner offrono ora una guida pratica. Fornisce elementi di analisi per comprendere meglio le leve per favorire l'accesso ai servizi, oltre a schede strumenti che descrivono i passaggi ei meccanismi per entrare in azione.

ACCESS'R Strategia

Il mantenimento e il rafforzamento dei servizi pubblici è un tema importante nelle zone rurali. Questo tema, che è una delle principali preoccupazioni degli abitanti locali, richiede di pensare all'emergere di nuove forme di presenza nel campo dei servizi postali, educativi, medici, sociali, ecc.
ACCESS'R si propone, infatti, di migliorare l'accessivilità delle aree rurali in Francia, promuovere la connessione, ma anche la collaborazione tra gli attori considerati nel processo.
Un insieme di smart villages nella condivisione di percorsi volti al collegamento di piccoli paesi dell'entroterra, ma anche volti alla sperimentazione di pratiche di valorizzazione reciproca.

- Cooperazione e condivisione;
- Servizi mobili e soluzioni di mobilità;
- Approcci SMART e digitali
- Fondi

Dati geografici:

Località: Nord Francia
Stato: Francia
Regione: più regioni
Lingua: Francese
Orario: UTC +2
Altitudine: 372 metri s.l.m.
Numero di abitanti: 336

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 10 francesi e 6 partners europei;
Periodo del progetto: 36 mesi, 2018 - 2021

- Sviluppare soluzioni smart per migliorare la mobilità, la sicurezza, l'efficienza energetica e la sostenibilità dei villaggi rurali.
- Creare un modello per la diffusione delle soluzioni smart.
- Aumentare la consapevolezza dei benefici delle soluzioni smart per i villaggi rurali.
- Sistemi di trasporto intelligenti che possono ridurre il traffico e migliorare la sicurezza stradale.
- Sistemi di sicurezza intelligenti che possono rilevare e prevenire i crimini.
- Sistemi di efficienza energetica che possono ridurre i costi energetici e migliorare la sostenibilità ambientale.
- Sistemi di gestione dei rifiuti intelligenti che possono ridurre la quantità di rifiuti prodotti e migliorare la qualità dell'ambiente.

Tematiche affrontate:

- Servizi pubblici;
- Salute;
- Educazione giovanile;
- Sport e cultura;
- Commercio;
- Mobilità digitale.

*Accessibility of services to population in rural areas (2020) https://ec.europa.eu/enrd/sites/default/files/4_project-accessr_marie-de-bizien_0.pdf

Penela

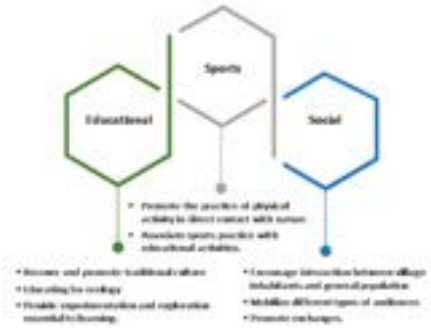
Il Comune di Penela ha una popolazione di circa 5 983 abitanti. Si trova nel distretto di Coimbra, nella regione Centro del Portogallo. Ferraria de São João è un villaggio di scisto situato in questo comune, situato in posizione remota sulla cima di una montagna. Conta 43 abitanti, di cui solo il 9% ha meno di 20 anni. Il villaggio offre un'alta qualità della vita ai suoi abitanti, offre accesso alla salute, all'istruzione, alla cultura e al tempo libero grazie alla sua vicinanza alla città di Penela e alla città di Coimbra. Ha una comunità locale che, pur invecchiando, assume un ruolo molto attivo nel processo decisionale dello sviluppo del villaggio. Il villaggio ha registrato livelli crescenti di investimenti nei settori del turismo e dell'agricoltura. Lo spopolamento e l'invecchiamento sono le sfide più significative che il villaggio sta affrontando e le più rilevanti per definire una strategia intelligente. La somma di queste sfide si traduce in una mancanza di capacità di attrarre nuovi residenti e risorse umane capaci. Ferraria de São João si distingue per l'alta qualità della vita che offre ai suoi abitanti grazie all'ambiente naturale e alla capacità di mobilitare il volontariato, in particolare attraverso iniziative legate al turismo. Il paese ha mostrato un crescente dinamismo nei settori turistico, agricolo e forestale, legato all'uso sostenibile delle risorse e al recupero e valorizzazione delle tradizioni locali.

Strategia

Si concentra sulla valorizzazione del patrimonio naturale del paese e del territorio circostante e sulla valorizzazione della sua identità rurale e comunitaria, nonché sul dialogo intergenerazionale basato sui valori tradizionali. Principalmente volto a creare nuove attività culturali, sociali e di intrattenimento che favoriscano l'integrazione tra residenti e turisti, rafforzando la coesione sociale e territoriale e rafforzando le dinamiche sociali e culturali.
Incentrato sul miglioramento dell'ambiente costruito attraverso la riqualificazione dello spazio pubblico e delle strutture, dotando le condizioni necessarie per la popolazione e creando le condizioni per l'attrazione e la fissazione di nuovi residenti e investitori.
Si concentra sulla valorizzazione dell'identità locale, attraverso il recupero dei beni del villaggio e del patrimonio immateriale, considerato una risorsa fondamentale per lo sviluppo dell'economia locale.
Si concentra sul potenziamento e sul sostegno degli investimenti nell'economia locale, contribuendo allo sviluppo sostenibile del villaggio, al benessere della popolazione, al declino della tendenza allo spopolamento e allo sviluppo regionale.

Dati geografici:

Località: Penela
Stato: Portogallo
Regione: Coimbra District
Lingua: Portoghese
Orario: Azzorre, Portogallo (GMT-1)
Altitudine: 164 metri s.l.m.
Numero di abitanti: 6.594



Dettagli del progetto e obiettivi:

Importo del progetto: € 5.004.130.20 budget
Numero di villaggi coinvolti: 2 villaggi;
Periodo del progetto: 2020 - 2029

- Valorizzare il patrimonio naturale del paese e del territorio.
- Promuovere l'identità rurale e comunitaria del villaggio.
- Favorire il dialogo intergenerazionale basato sui valori tradizionali.
- Creare nuove attività culturali, sociali e di intrattenimento.
- Rafforzare la coesione sociale e territoriale.
- Riqualificazione dello spazio pubblico e delle strutture.
- Recuperare i beni del villaggio e il patrimonio immateriale per valorizzare l'identità locale.
- Sostenere gli investimenti nell'economia locale.
- Migliorare il benessere della popolazione e contrastare lo spopolamento.
- Contribuire allo sviluppo regionale.

Tematiche affrontate:

- Conservazione del patrimonio naturale;
- Promozione della sostenibilità ambientale;
- Promozione della protezione e sicurezza delle persone e dei beni.

*Penela Smart Village (2020) https://www.smartrural21.eu/villages/penela_pt/

PHINI - CIPRO

Phini

Situato nelle montagne del Troödos a Cipro, è un villaggio con una lunga storia. Le sue origini risalgono probabilmente all'antichità, quando la posizione geografica e le risorse naturali dell'area favorirono lo sviluppo di piccole comunità agricole. Durante il periodo bizantino, Foini fu influenzato dai cambiamenti culturali e religiosi dell'isola, con la possibile costruzione di monasteri e chiese nella zona. Con il dominio veneziano, il villaggio partecipò all'espansione economica e agli scambi commerciali che caratterizzarono l'isola in quel periodo. Il passaggio sotto l'Impero Ottomano segnò un cambiamento, con conseguenze economiche meno favorevoli, ma mantenendo una certa stabilità. Nel corso del XX secolo, Foini attraversò i numerosi eventi storici che condussero all'indipendenza di Cipro nel 1960, seguendo le sorti dell'intera isola. Foini conserva esempi di architettura tradizionale, con edifici realizzati in pietra e strutture tipiche delle comunità montane di Cipro. L'economia del villaggio si basa prevalentemente su attività agricole e sull'allevamento, che continuano a rappresentare una parte importante della vita locale. Le tradizioni del villaggio, strettamente legate al ciclo della vita agricola e alle festività religiose, riflettono l'eredità culturale della comunità, che ha mantenuto intatte molte delle sue antiche usanze nel corso del tempo.

Community Council

Il Consiglio della Comunità di Phini organizza dal 2019 una Conferenza Culturale Nazionale annuale, ogni anno dedicata a un tema specifico.
Nel 2019, la prima conferenza ha trattato "La ceramica di ieri e di oggi a Phini", mentre nel 2020 il tema è stato "Phini: patrimonio storico e culturale dall'antichità ai giorni nostri". Nel 2021, la terza conferenza si è focalizzata su "La vita e la permanenza dei giovani nelle aree montane e i loro bisogni". Nonostante le restrizioni dovute alla pandemia, oltre 180 delegati partecipano mediamente ogni anno.
Le conferenze offrono uno spazio per mostre di prodotti locali, come la ceramica, manufatti artigianali e il famoso dolce locale, "Phiniotiko Loukomi". Questi eventi permettono ai partecipanti, specialmente ai giovani, di condividere idee e proposte riguardo a politiche legate ai temi trattati, con particolare attenzione alle opportunità di finanziamento per investimenti in aree montane, agricoltura, artigianato e turismo.
L'organizzazione coinvolge diversi attori locali e regionali, tra cui scuole, ONG, enti governativi e reti rurali nazionali. Viene inoltre prodotto un bollettino che riassume le raccomandazioni emerse durante la conferenza e viene distribuito ai principali enti nazionali.

Dati geografici:

Località: Troödos Mountains, Cipro
Stato: Cipro
Lingua: Greco
Popolazione: 391 persone
Orario: (CET), UTC +3 (EEST)
Altitudine: 1.000 metri s.l.m.
Numero di abitanti: 3.604

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 comunità;
Periodo del progetto: 2019 - oggi
Obiettivi:

- **Promuovere il patrimonio culturale locale:** Valorizzare la storia, le tradizioni e le attività artigianali, con particolare attenzione alla ceramica;.
- **Coinvolgere la comunità e i giovani:** Esprimere idee e aspirazioni per il futuro, incentivando la loro partecipazione attiva nella vita comunitaria.
- **Sviluppare politiche per le aree montane:** Discutere e proporre politiche che favoriscano il miglioramento delle condizioni di vita (istruzione, sanità, trasporti, occupazione e servizi di base).
- **Favorire opportunità di investimento:** Possibilità di finanziamento per l'agricoltura, al turismo, all'artigianato e ai servizi, sostenendo lo sviluppo economico locale.
- **Facilitare la cooperazione tra attori locali e nazionali:** Rafforzare le collaborazioni tra enti locali, scuole, ong e altro.

Tematiche affrontate:

- Infrastrutture e connessioni;
- Istruzione e formazione;
- Sostenibilità ambientale ed energetica;
- Sviluppo economico e turismo;
- Cultura e tradizioni.

*Phini Community Council. (2024). About Phini. https://www.phinivillage.com/cgibin/hweb?-A=78&-V=about

Raudanmaa

Raudanmaa è una zona rurale con circa 600 abitanti composta da diversi piccoli villaggi. Le persone vivono molto vicino alla natura nella nostra zona, e questo è un grande vantaggio che i nostri villaggi possono offrire sia ai nuovi residenti che ai visitatori. La nostra principale aspirazione è quella di essere un villaggio innovativo e orientato ai servizi, dove la vita quotidiana scorre senza intoppi. Vogliamo portare nuovi fattori abilitanti innovativi per rilanciare l'economia del villaggio e le condizioni di vita.
Siamo orgogliosi della nostra comunità locale che è molto attiva e solidale con nuove iniziative. Abbiamo diverse associazioni attive e organizziamo incontri regolari di paesani su questioni che riguardano tutti. Abbiamo costruito il nostro approvvigionamento idrico, il sistema fognario e la rete in fibra ottica. Una delle nostre principali preoccupazioni ora è creare un municipio intelligente multiservizio ben funzionante che fornisca attività e servizi ai residenti locali e ai visitatori della zona. Abbiamo raccolto le opinioni e le idee di tutti gli abitanti del villaggio per sviluppare un piano per il municipio e stiamo attualmente sviluppando piani dettagliati sulla costruzione, il funzionamento e la sostenibilità della nostra sala.

Strategia SMART

Per Raudanmaa "smartness" implica essere un villaggio innovativo e orientato ai servizi, dove la vita quotidiana procede senza intoppi. L'obiettivo è mantenere viva l'area del villaggio rurale e preservare l'ambiente fisico e culturale distintivo, nonché il patrimonio creato dallo stile di vita comune e tradizionale nei villaggi. Nuovi fattori abilitanti innovativi sono introdotti per rilanciare l'economia del villaggio e migliorare le condizioni di vita. Le connessioni di rete veloci e le possibilità di telelavoro offrono nuove opportunità, che sono in parte già utilizzate e potrebbero essere sfruttate e commercializzate in modi innovativi. I servizi digitali possono facilitare la cooperazione efficace e la condivisione aperta delle informazioni sia all'interno della comunità che con visitatori ed enti esterni. Si sostengono fonti vitali di vita, benessere sociale e fisico, fornendo servizi innovativi per tutti gli abitanti dei villaggi in questa zona rurale. Le principali aspirazioni di sviluppo per le attività di sviluppo dei villaggi intelligenti sono legate a tre aree principali: ambiente, cultura e vitalità. "Smart" significa naturalmente l'uso della nuova tecnologia, ma l'intelligenza sociale è altrettanto cruciale mentre si cerca di migliorare la cultura tradizionale del villaggio e portarla a un nuovo livello nel contesto digitale.

Dati geografici:

Località: Raudanmaa
Stato: Finlandia
Regione: Satakunta
Lingua: Finlandese
Orario: UTC+03:00
Altitudine: 121 metri s.l.m.
Numero di abitanti: 510

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: 2017 - 2019.
Progetti propri
• Cooperativa idrica Kautiala 2010
• Cooperativa fibra ottica Raudanmaa 2017
• Progetto di pianificazione del municipio intelligente 7/2019 – 5/2021
• Cooperativa del villaggio di Raudanmaa 2020
Obiettivi:

- Promuovere l'innovazione e fornire servizi orientati che migliorano la qualità della vita quotidiana dei residenti.
- Mantenere viva l'area del villaggio rurale preservando l'ambiente fisico e culturale distintivo.
- Introdurre nuovi fattori abilitanti per rilanciare l'economia locale.
- Sfruttare connessioni di rete veloci, opportunità di telelavoro e servizi digitali per creare nuove opportunità economiche.

Tematiche affrontate:

- Migliorare la vitalità del villaggio;
- Ambiente di vita e campagna pulita;
- Cultura del villaggio innovativa.

*Raudanmaa Smart Village Strategy. (2021). Smartrural21.eu. https://www.smartrural21.eu/wp-content/uploads/Raudanmaa_Strategy-Highlight-1.pdf

REMETEA - ROMANIA

Remetea

Situata nella zona montuosa del bacino di Giurgiu nella contea di Harghita, in Romania, Remetea è una di queste dei più grandi villaggi della regione.
Il paese è adagiato ai piedi dei monti vulcanici di Giurgiu, ad un'altitudine media di 750 metri sul livello del mare. La popolazione è di 6.171 abitanti, la grande maggioranza è di etnia ungherese di confessione cattolica romana. La superficie totale del villaggio è di 10.774 ettari, di cui il villaggio stesso copre 1.145 ettari. Remetea e i villaggi intorno ad essa hanno in genere lunghi inverni freddi ed estati brevi. La temperatura media annuale è compresa tra 5,1 e 5,5 gradi Celsius. Il fiume Mureş, che entra in Remetea da sud, descrivendo ampie curve che dividono in due il villaggio, è il fiume più grande a livello locale. Sulla riva destra del Mureş si trova la palude di Nagyrét sono sopravvissute specie vegetali rare dall'era glaciale. Nel 1980, quattro ettari di questa terra sono stati dichiarati riserva naturale. La gestione amministrativa del villaggio è assicurata dal consiglio locale come autorità deliberativa, costituito da 15 consiglieri locali come autorità esecutiva. La struttura specialistica del comune è un'organizzazione di dimensioni ristrette, che esegue le decisioni del consiglio locale e le disposizioni del sindaco. Si cerca di rispondere a tutte le esigenze della comunità.

Remetea Strategia

Il concetto di "villaggio intelligente" affronterà i bisogni emergenti identificati nella comunità, attraverso le seguenti azioni: ampliare le opportunità di lavoro sia per la popolazione giovane che per quella anziana promuovendo il lavoro a distanza/il lavoro online; diversificare il mercato del lavoro incoraggiando l'avvio di imprese ICT; promuovere il marketing digitale; organizzazione di volontariato e beneficenza online; utilizzando piattaforme online per il trasferimento di conoscenze intergenerazionali. consentire l'istruzione online per bambini, giovani e adulti; creazione di una piattaforma educativa per le scuole; programmi educativi di tipo doposcuola, incentrati sulle competenze ICT, creazione di una piattaforma di presentazione con informazioni utili sulla salute, programmazione, informazioni preliminari su servizi e consulenze mediche; organizzazione di campagne digitali sullo stile di vita salutare. Monitoraggio delle condizioni del suolo e delle piante; raccolta di dati specifici tramite sensori; educazione del consumatore; realizzazione di un'applicazione nel campo dei servizi e dei consumi idrici e fognari. Lancio di "RemeteApp"; digitalizzazione dell'amministrazione, tenuta dei registri, genealogia; trasmissione di eventi in diretta; sondaggi d'opinione tramite applicazioni mobili; promuovere l'impegno pubblico.

Dati geografici:

Località: Remetea
Stato: Romania
Regione: Transilvania
Lingua: Rumeno
Orario: (EET), UTC +2
Altitudine: 750 m s.l.m.
Numero di abitanti: 6.261

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: entro il 2021.

Obiettivi:

- Rispondere all'emigrazione giovanile
- Diversificare le opportunità educative
- Apertura di opportunità di apprendimento online non formale per adulti Miglioramento dei servizi sanitari e della prevenzione
- Rendere i servizi pubblici più efficienti sviluppando il servizio pubblico online
- Ambiente
- Fornire informazioni affidabili e autentiche agli abitanti

Tematiche affrontate:

- Comunità e identità locale
- E-governance e servizi locali accessibili
- Standard di vita e questioni ambientali
- Educazione digitale e studenti SMART
- Attività imprenditoriale limitata e mancanza di accesso al mercato.

*Remetea Smart Village Strategy. (2020). Smartrural21.eu. https://www.smartrural21.eu/wp-content/uploads/Remetea_Strategy-Final-Draft_20201208-v2.pdf

Saragozza

Saragozza, con oltre 2000 anni di storia, è nota per la sua Basilica del Pilar imponente, le sue origini romane, la sua ricca diversità culturale e l'ospitalità della sua gente. Situata sulle rive del fiume Ebro, è il capoluogo dell'Aragona e la quinta città spagnola per dimensione demografica. Cruciale nodo di collegamento tra importanti vie di comunicazione che conducono ad altre grandi città spagnole, rappresenta una meta ideale per un city break. L'aeroporto internazionale, la stazione ferroviaria ad alta velocità e una rete stradale ben sviluppata consentono di raggiungere in 2-3 ore le principali destinazioni nel nord e nel centro della Spagna, nonché nel sud della Francia. Saragozza è celebre per il suo ricco patrimonio storico e monumentale, testimone delle influenze di quattro antiche culture. La Basilica di Nuestra Señora del Pilar, simbolo della città e seconda cattedrale di Saragozza, ospita opere maestose di Francisco de Goya e la venerata scultura della Virgen del Pilar. A breve distanza si trova la cattedrale del Salvador, principale tempio storico della città e un esempio emblematico dell'arte mudéjar aragonese, patrimonio mondiale dell'umanità dell'UNESCO. La cattedrale custodisce anche una delle più importanti collezioni di arazzi fiamminghi dei secoli XV-XVII.

Barrio Solar

Protagonisti sono le famiglie, i negozi, le imprese, le associazioni e gli enti che si trovano a 500 metri dall'impianto fotovoltaico. Barrio Solar è un'iniziativa che vuole raggiungere tutte le persone del quartiere in cui è installato, quindi una percentuale dell'energia che genera va alle famiglie del quartiere che si trovano in una situazione di povertà energetica senza dover pagare alcun canone mensile , beneficiando semplicemente del risparmio sulla bolletta che l'autoconsumo solare genera per te. Inoltre, sia i clienti EDP che qualsiasi altra azienda possono partecipare a Barrio Solar. Il progetto, coordinato da ECODES e realizzato in collaborazione e con il supporto di Edp Solar, Ayuntamento de Zaragoza, Schneider Electric Foundation e Fundaciòn edp, prevede l'installazione di un impianto fotovoltaico da 100kWp sul tetto di un edificio pubblico. A fronte del pagamento di un abbonamento mensile (circa 7 euro) coloro che si trovano a 500 metri dalla struttura potranno beneficiare di un risparmio di circa il 30% dei costi energetici. L'abbonamento copre il costo anche per il 10% di famiglie vulnerabili in condizione di povertà energetica che abitano il quartiere e che potranno usufruire dei vantaggi senza alcuna spesa.Alla base del progetto, in corso di realizzazione, c'è una forte azione di informazione, formazione e coinvolgimento dei cittadini.

Dati geografici:

Località: Saragozza
Stato: Spagna
Regione: Aragona
Lingua: Spagnolo
Orario: (EET), UTC +2 (CEST)
Altitudine: 208 m s.l.m.
Numero di abitanti: 682.513

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: Intera Città;
Periodo del progetto: entro il 2021.

Obiettivi:

- Fornire energia sostenibile e accessibile
- Combatte la povertà energetica
- Inclusione sociale ed economica
- Partecipazione comunitaria
- Collaborazione multi-stakeholder

Tematiche affrontate:

- Comunità energetica.

*Barrio Solar: Un progetto pilota per l'autoconsumo condiviso di energia solare nelle aree urbane. (2021). Fratello Sole. https://www.fratellosole.org/

STANZ - AUSTRIA

Stanz

Stanz im Mürztal si trova in una zona rurale nella provincia austriaca della Stiria con una popolazione totale di 1 855 abitanti. Stanz è un'autorità locale con rappresentanti politici eletti. Negli ultimi anni sono stati sviluppati con successo i temi della valorizzazione del centro paese, della creazione di nuove offerte di mobilità e delle misure per migliorare la qualità della vita. I residenti apprezzano la qualità della vita nel villaggio: i risultati di un sondaggio condotto di recente rivelano che la scuola, l'asilo e la vita civica sono state le più votate dai residenti. La regione è industriale ed è stata colpita da cambiamenti strutturali economici negli ultimi decenni, che è una delle ragioni del forte spopolamento e dell'invecchiamento della popolazione. La piccola economia del paese si riflette nell'alta percentuale di residenti che si recano al lavoro nelle zone limitrofe. Stanz ha deciso di intraprendere nuove strade nella costruzione della comunità: rafforzare la democrazia diretta, coinvolgere attivamente i cittadini nello sviluppo municipale, costruire infrastrutture sostenibili e di conseguenza, per migliorare la resilienza a livello locale, le persone e il loro impegno possono essere visti come una risorsa importante. Un ulteriore vantaggio è che l'80% del territorio comunale di Stanz è costituito da foreste, che offrono opportunità per la produzione di energia sostenibile.

Stanz Strategia

Stanz ha introdotto un nuovo fornitore alimentare locale che garantisce che il 50% delle merci provenga direttamente dai produttori locali. Per ridurre gli sprechi, un ristorante nelle vicinanze utilizza i prodotti del negozio, come frutta, verdura e carne, cucinandoli e offrendoli come cibo da asporto nel negozio stesso. Inoltre, un distributore automatico di cibo offre un servizio aggiuntivo disponibile 24 ore su 24.
Per promuovere la mobilità alternativa e sostenibile, Stanz ha lanciato l'iniziativa delle "Mitfahr-Bankerl" - panchine dipinte di giallo/verde posizionate lungo le strade pubbliche, ciascuna con un ombrello attaccato. Quando l'ombrello è aperto, indica che la persona seduta sulla panca è in cerca di un passaggio.
Negli ultimi tre anni, gli edifici vuoti nel centro del villaggio sono stati ristrutturati in modo sostenibile, integrando anche costruzioni in legno. Questo ha portato alla creazione di un nuovo centro polifunzionale che include appartamenti per giovani e anziani, il suddetto negozio, due strutture di servizio e il nuovo edificio amministrativo del comune, migliorando così l'amministrazione della comunità.

Dati geografici:

Località: Stanz
Stato: Austria
Lingua: Austriaco
Orario: (CET), UTC +1
Altitudine: 1.040 metri s.l.m.
Numero di abitanti: 441

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: fino al 2021

Obiettivo 1:
Essere autosufficienti dal punto di vista energetico entro il 2030
Obiettivo 2:
Stabilire il turismo sostenibile come nuovo pilastro economico
Obiettivo 3:
Sviluppare ulteriormente la società civile

Tematiche affrontate:

- Declino della popolazione;
- Depauperamento del centro del paese;
- Mancanza di lavoro;
- Perdita delle infrastrutture di approvvigionamento;
- Mancanza di negozi locali e di alloggi;
- Dipendenza dal traffico automobilistico;
- Mancanza di partecipazione ai processi decisionali.

*Stanz Smart Village Strategy. (2021). Smartrural21.eu. https://www.smartrural21.eu/wp-content/uploads/Stanz_Strategy-Highlight.pdf

Tomaszyn

Tomaszyn è un piccolo villaggio in Warmia e Masuria. Si compone di dieci famiglie e una cooperativa. È il polmone verde della Polonia e ha la densità di popolazione più bassa del paese. Ci sono otto parchi paesaggistici nel voivodato, che ospitano fenomeni naturali su scala europea. È stato un villaggio agricolo e prospero per molti secoli, le prime informazioni scritte risalgono al 1410. Tuttavia, la maggior parte degli edifici del villaggio furono distrutti durante la seconda guerra mondiale. La popolazione si è ridotta a quattro fattorie e diversi vacanzieri raggiungendo il punto più basso nel 2017. Un anno dopo, la Cooperativa Ostoja Natury è stata costituita e si è stabilita a Tomaszyn. Ostoja Natury è l'"ecosistema agricolo di domani", che costituisce il modello di fattoria di riferimento del villaggio intelligente. Questa fattoria biologica è un circuito chiuso in cui i rifiuti sono combustibile, producono energia, consentono la produzione di cibo tutto l'anno e lavorano in modo più efficiente, garantendo rese più elevate. Proprio come in una foresta preistorica: il circuito è tutto, i rifiuti non esistono. L'obiettivo è creare un ecosistema progettato per fornire efficienza economica con un'influenza minima sull'ambiente. Metodi collaudati nel corso dei secoli, vengono rinnovati e implementati, utilizzando le innovazioni tecnologiche dei tempi moderni.

Piotr Ostaszewski Tomaszyn

Collective Farm In Tomaszyn
Il programma Ostoja Natury - Ostoja Wioska 3.0 presuppone la preparazione di un completo "know how" sui principali aspetti del funzionamento di un'azienda agricola biologica, tra cui:
• metodi di produzione adattati alle condizioni pedoclimatiche;
• un insieme di soluzioni tecnologiche;
• offerte di un parco macchine ottimale;
• robotizzazione e automazione della produzione e trasformazione agricola;
• costruire una moderna piattaforma distributiva che consenta l'interazione con i clienti e la vendita diretta;
• accesso alla banca dei semi (sementi BIO);
• costruzione di un habitat modello, autosufficiente e privo di rifiuti per le aziende agricole rurali;
• implementazione e ottimizzazione di un modello di business funzionante;
• costruire un gruppo di produttori indipendenti e cooperative basato su una distribuzione comune;
• piattaforma, comunicazione, tecnologia, banca della conoscenza e semi.

Dati geografici:

Località: Tomaszyn
Stato: Polonia
Regione: Gmina Olsztynek
Lingua: Polacco
Orario: UTC+01:00
Altitudine: 135 metri s.l.m.
Numero di abitanti: 18

Dettagli del progetto e obiettivi:

Importo del progetto: 7.700.00 EUR0 €
Numero di villaggi coinvolti: 1
Periodo del progetto: 21 mesi

Obiettivi del villaggio smart di Piotr Ostaszewski Tomaszyn:

- Migliorare la qualità della vita dei residenti.
- Ridurre l'impatto ambientale del villaggio.
- Rendere il villaggio più efficiente dal punto di vista energetico.
- Creare un ambiente più sicuro e accogliente per i residenti.
- Sviluppare un'economia più resiliente.

Tematiche affrontate:

- Ostoja Natury Village 3.0;
- Centro biologico;
- Habitat privo di rifiuti e autosufficiente per le famiglie rurali;
- Sistema di irrigazione passivo, a pioggia;
- Serre passive.

* Tomaszyn. (2023). Smart village strategy_. https://www.smartrural21.eu/wp-content/uploads/Tomaszyn-Smart-village-strategy_.pdf

VUOLLERIM - SVEZIA

Vuollerim

Villaggio situato nel comune di Jokkmokk, nella contea di Norrbotten, nel nord della Svezia, immerso nel cuore della Lapponia. La sua storia è strettamente legata alla presenza del popolo sami, gli abitanti indigeni della regione, noti per la loro tradizione di allevamento delle renne e uno stile di vita profondamente connesso alla natura. Si presume che il villaggio sia stato abitato da secoli, seguendo le dinamiche e le trasformazioni tipiche della regione lappone. Con il tempo, ha vissuto cambiamenti significativi, influenzati dall'industrializzazione e dalle migrazioni verso le città, affrontando la sfida di mantenere la sua popolazione e la sua identità culturale. Negli ultimi decenni, il turismo ha contribuito a rilanciare l'economia locale, con un'attenzione particolare all'esperienza culturale e naturalistica. I visitatori vengono attratti dalla possibilità di conoscere la cultura sami, partecipare a attività tradizionali come le escursioni con le renne, la pesca sul ghiaccio, e degustare piatti locali, immersi in un paesaggio incontaminato. Un evento di grande rilievo è il Festival delle 1000 Lanterne di Ghiaccio, che si tiene ogni febbraio con migliaia di lanterne di ghiaccio, creando un'atmosfera suggestiva che celebra l'inverno e la bellezza del paesaggio lappone.

Collaborazione locale

La strategia "smart" di Vuollerim si fonda su un modello di sviluppo economico locale innovativo e collaborativo, basato sulla partecipazione attiva della comunità. Nel villaggio, sono presenti circa 60 piccole imprese, 40 associazioni non-profit e 7 aziende rurali, che operano in sinergia per promuovere la crescita sostenibile del territorio.
Un ruolo cruciale in questa strategia è svolto da Vuollerimbygdens Ekonomiska Förening, un'associazione economica che ha rappresentato il punto di partenza per un nuovo approccio alla gestione collettiva delle aziende. Negli ultimi 20 anni, questo modello si è diffuso, coinvolgendo vari attori locali. L'obiettivo è ottimizzare le risorse, favorire l'occupazione e migliorare la qualità della vita degli abitanti, creando un'economia locale resiliente e sostenibile, fondata sulla cooperazione e sull'innovazione.
Attraverso il supporto alle piccole imprese e alle iniziative imprenditoriali locali, Vuollerim sta affrontando le sfide tipiche delle aree rurali, come lo spopolamento e l'invecchiamento della popolazione, promuovendo un ambiente favorevole all'innovazione sociale e allo sviluppo economico.

Dati geografici:

Località: Vuollerim
Stato: Svezia
Regione: Norrbotten (Norrbottens län)
Lingua: Svedese
Orario: CET (Central European Time), UTC+1 (durante l'ora solare); CEST (Central European Summer Time), UTC+2 (durante l'ora legale)
Altitudine: 400-500 metri s.l.m.
Numero di abitanti: 732

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: Intera Città;
Periodo del progetto: Oltre 20 anni.

Obiettivi:
- Favorire lo sviluppo economico locale;
- Promuovere la cooperazione tra imprese e comunità;
- Creare nuove opportunità per i giovani e le famiglie;
- Sostenere l'innovazione e la resilienza nelle aree rurali;
- Incrementare la qualità della vita attraverso il coinvolgimento attivo della comunità.

Tematiche affrontate:

- Cooperative di Comunità;
- Sviluppo economico locale;
- Cooperazione comunitaria;
- Opportunità per giovani e famiglie;
- Innovazione nelle aree rurali;
- Qualità della vita e coinvolgimento comunitario.

*Barrio Solar: Un progetto pilota per l'autoconsumo condiviso di energia solare nelle aree urbane. (2021). Fratello Sole. https://www.fratellosole.org/

SOMMARIO ANALISI SMART VILLAGES EUROPEI

Mappa dei villaggi analizzati

Elenco dei villaggi europei analizzati e delle tematiche maggiormente trattate

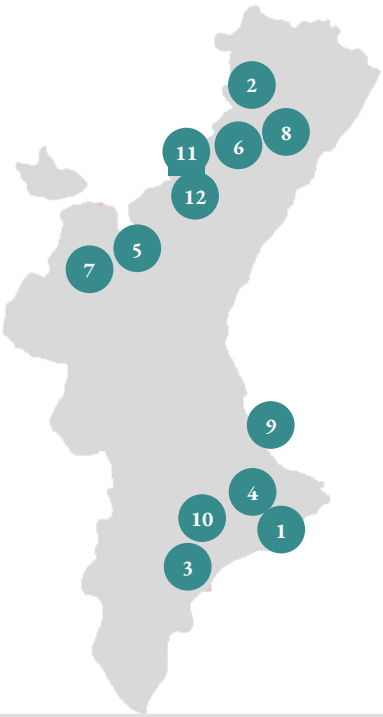
SMART VILLAGES EUROPEI			
	Localizzazione	Smart Village	Tematica
1	Olanda	*Piotr Ostaszewski Tomaszyn*	Fattoria collettiva
2	Lettonia	*Alsunga*	Potenziamento del mercato locale
3	Grecia	*Kythera*	Tecnologia per l'agricoltura
			Introduzione delle certificazioni
			Strategia di marketing locale
4	Francia	*Lavancourt (Acces'R)*	Accessibilità mediante il potenziamento del trasporto locale
5	Portogallo	*Panela*	Piano di marketing
			Potenziamento del mercato locale
			Creazione di una zona di protezione del villaggio
			Potenziamento del mercato agricolo
6	Finlandia	*Raudanmaa*	Digital services
			Digital Village Hub
			Mappatura dei percorsi
			Potenziamento dell'agricoltura anche come terapia
7	Romania	*Remetea*	Preservare l'identità locale con il digitale
			e-governance
			Miglioramento del sistema di illuminazione pubblica
			Sistema idrico-fognario intelligente
8	Austria	*Stanz*	Autosufficienza energetica
			Turismo sostenibile
			Sviluppo della società civile
9	Polonia	*Tomaszyn*	Probiotecnologia
			Tunnel di foil per agricoltori
			Impianto di biotrattamento
			Produzione di canapa
10	Spagna	*Ansò*	Technological connectivity
			Fashion designers
			Community engagment
			Neighbourhood Housing
11	Germania	*Sollstedt*	Smart infrastructure
			New and digital services
			Digital channel
12	Svezia	Vuollerim	Cooperative di comunità
			Empowerment giovanile
			Qualità della vita
13	Cipro	Phini	Conferenze internazionali
			Valorizzazione dei prodotti locali
			Internazionalizzazione

Statistica delle tematiche maggiormente trattate

Il grafico relativo ai Smart Villages europei evidenzia sei tematiche chiave: commercio, digitalizzazione, agricoltura, infrastrutture, governance ed energia, tutte riscontrabili in contesti socioeconomici variabili. In questo scenario, il commercio emerge come il fattore iniziale più significativo, poiché favorisce la diffusione dei prodotti tipici e stimola l'interazione con mercati più ampi, contribuendo a costruire una rete di resilienza economica.
La digitalizzazione, pur non essendo il punto di partenza, gioca un ruolo fondamentale nel potenziare le altre categorie, ottimizzando le operazioni commerciali e migliorando la competitività dei prodotti locali. L'agricoltura si presenta come un pilastro essenziale, soprattutto in contesti rurali, dove pratiche sostenibili possono incrementare la produzione alimentare.
Le infrastrutture, sia fisiche che digitali, sono cruciali per garantire l'efficacia delle strategie di sviluppo, facilitando il commercio e l'accesso ai servizi. Infine, una governance forte e partecipativa è fondamentale per garantire una gestione efficace delle risorse e promuovere la partecipazione della comunità.
Ulteriori casi studio sono disponibili su piattaforme come Rural 21 e Rural 27, che analizzano villaggi europei impegnati in programmi per sviluppare strategie di trasformazione in "smart". La condivisione delle esperienze e delle best practices tra villaggi rappresenta una via promettente per promuovere uno sviluppo sostenibile e resiliente.

Smart Villages Valenciani

SMART VILLAGES VALENCIA



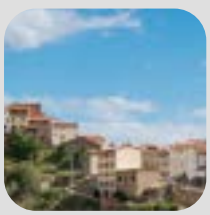
1. Altea

2. Ares del Maestrat

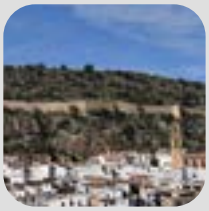
3. Biar

4. Bocairent

5. Chelva



6. Chodos



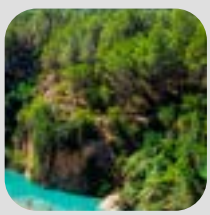
7. Chulilla

8. Culla

9. Dènia

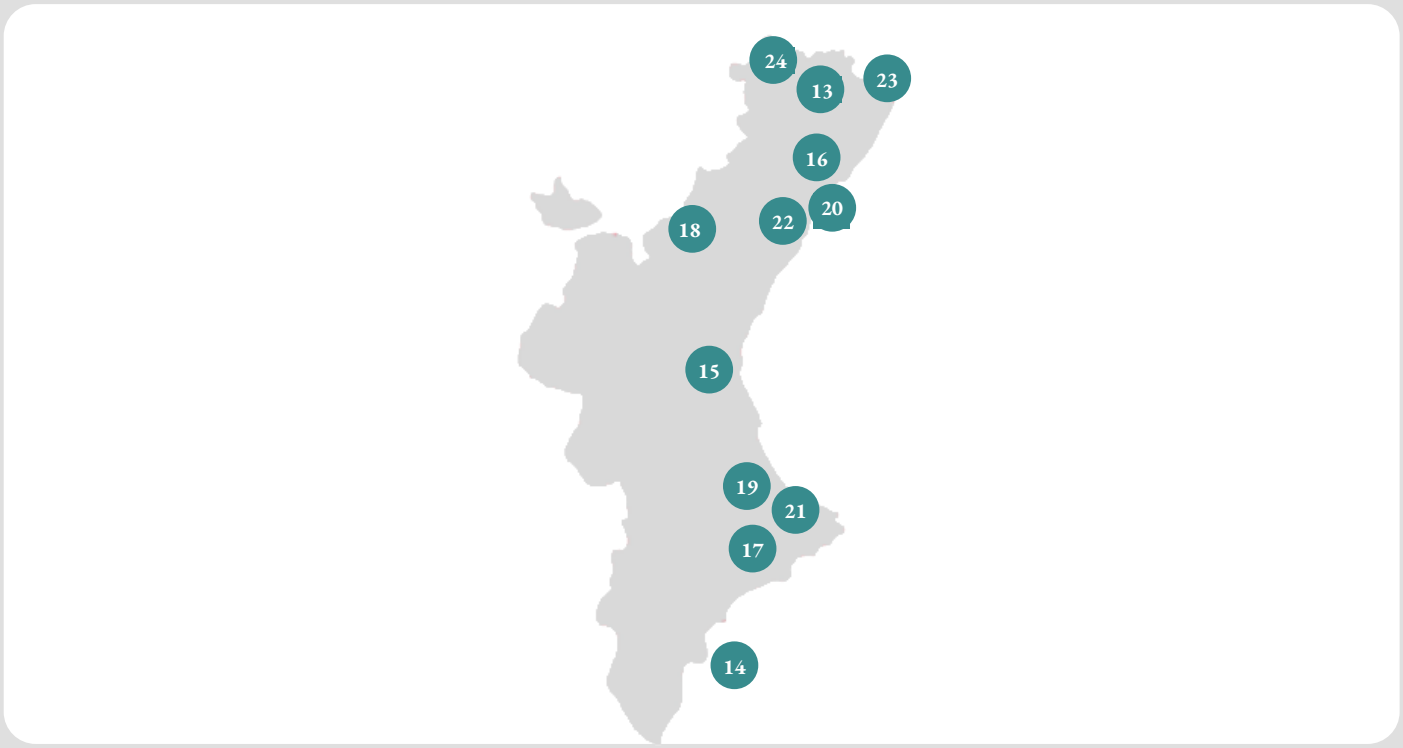
10. Guadalest

11. Jerika



12. Montanejos

SMART VILLAGES VALENCIA

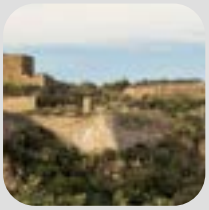


13. Morella

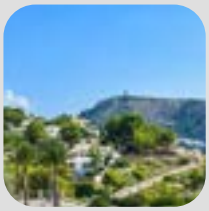
19. Serra

14. Nueva Tabarca

20. Sueras



15. Sagunto



21. Teulada - Moraira

16. San Mateo

22. Teruel

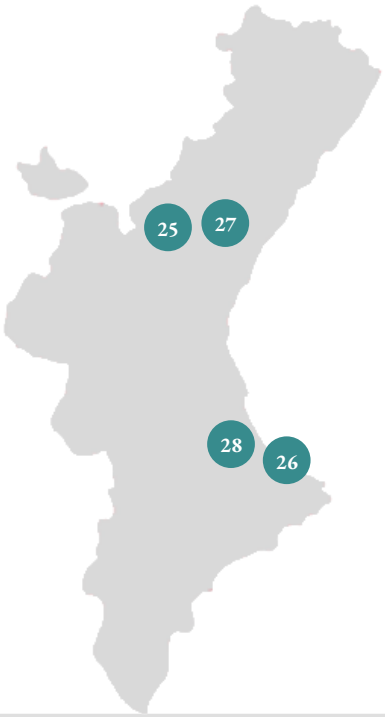
17. Sax

23. Tinença di Benifassà

18. Segorbe

24. Todolella

SMART VILLAGES VALENCIA



25. Vilafàmes

26. Villajoyosa

27. Villahermosa del Rio

28. Xativa

ALTEA

Altea

Altea è un comune situato nella comunità autonoma Valenciana, nella provincia di Alicante, precisamente nella comarca di la Marina Baixa. Con una popolazione di circa 23.115 abitanti, Altea è un pittoresco villaggio costiero caratterizzato da un affascinante centro storico bianco e blu che si affaccia sul Mar Mediterraneo. Celebre per le sue spiagge, tra cui spiccano la Playa de Altea, la Playa de la Roda e la Playa de la Calera, Altea costituisce una rinomata destinazione turistica apprezzata sia per la sua bellezza naturale che per il suo ricco patrimonio storico e culturale.
Tra le attrazioni più significative di Altea vi sono il Castello medievale di Altea, dominante sul villaggio, la Chiesa barocca del XVIII secolo di Santa Ana, il Museo Picasso che ospita una collezione di opere del celebre artista Pablo Picasso, oltre alle varie spiagge come la lunga e sabbiosa Playa de Altea, la più piccola e tranquilla Playa de la Roda, e la rocciosa Playa de la Calera con le sue acque cristalline.
Facilmente accessibile da Valencia tramite treno o auto, Altea attrae visitatori in cerca di paesaggi incantevoli e esperienze culturali immerse nella vivace atmosfera mediterranea.

Smart Village Altea

Nel 2019, Altea è stata selezionata come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti; La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Altea di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile;
La promozione di attività ricreative e sportive per i giovani;Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Altea, Spagna
Distretto: Marina Baixa
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 230 metri s.l.m.
Numero di abitanti: 23.500

Dettagli del progetto e obiettivi:

- Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente. Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico.
- Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
- Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica.
- Il comune ha promosso eventi culturali e turistici sostenibili. Questo ha contribuito a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Tematiche affrontate:

- Sostenibilità e Raccolta differenziata;
- Innovazione;
- Turismo;
- Accessibilità;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

ARES DEL MAESTRAT

Ares del Maestrat

Ares del Maestrat è un comune spagnolo di 1.357 abitanti situato nella comunità autonoma Valenciana.
Si trova nella provincia di Castellón, nella comarca del Maestrazgo.
Ares del Maestrat è un villaggio medievale molto ben conservato, con un centro storico labirintico di stradine strette, piazze e fontane.
Il villaggio è anche circondato da montagne, che offrono splendide viste panoramiche.
Tra le attrazioni turistiche di Ares del Maestrat ci sono:
Il castello di Ares del Maestrat, un castello medievale costruito su una collina che domina il villaggio.
La Iglesia de Santa María la Mayor, una chiesa gotica del XIV secolo.
La Plaza Mayor, una piazza principale del villaggio con un'antica fontana.
Il Museo de Ares del Maestrat, un museo che ospita una collezione di reperti archeologici e storici provenienti dal villaggio e dai dintorni.
Ares del Maestrat è una destinazione turistica popolare, sia per la sua storia e cultura che per la sua bellezza naturale. Il villaggio è facilmente raggiungibile da Valencia in treno o in auto.

Smart Village Ares del Maestrat

Nel 2017, Ares del Maestrat è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti;
La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Ares del Maestrat di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile; La promozione di attività ricreative e sportive per i giovani;
Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Ares del Maestrat, Spagna
Distretto: Alcalà de Xivert-Alcalatén
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 625 metri s.l.m.
Numero di abitanti: 217

Dettagli del progetto e obiettivi:

- Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente.
- Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico.
- Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
- Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica.
- Il comune ha promosso eventi culturali e turistici sostenibili.

Tematiche affrontate:

- Sviluppo sostenibile;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Biar

Biar è un comune spagnolo di 1.131 abitanti situato nella comunità autonoma Valenciana. Si trova nella provincia di Alicante, nella comarca di Vinalopó Mitjà. Biar è un villaggio medievale molto ben conservato, con un centro storico labirintico di stradine strette, piazze e fontane. Il villaggio è anche circondato da montagne, che offrono splendide viste panoramiche.

Tra le attrazioni turistiche di Biar ci sono:

- Il castello di Biar, un castello medievale costruito su una collina che domina il villaggio.
- La Iglesia de San Bartolomé Apóstol, una chiesa gotica del XIV secolo.
- La Plaza Mayor, una piazza principale del villaggio con un'antica fontana.
- Il Museo de Biar, un museo che ospita una collezione di reperti archeologici e storici provenienti dal villaggio e dai dintorni.
- Biar è una destinazione turistica popolare, sia per la sua storia e cultura che per la sua bellezza naturale. Il villaggio è facilmente raggiungibile da Valencia in treno o in auto.

Smart Village Biar

Nel 2019, Biar è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti;
La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Biar di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile;
La promozione di attività ricreative e sportive per i giovani; Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Biar, Spagna
Distretto: Vinalopó Mitjà
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 726 metri s.l.m.
Numero di abitanti: 3.693

Dettagli del progetto e obiettivi:

Ecco alcuni esempi specifici delle strategie smart e innovative che Biar ha attuato per migliorare le sue condizioni e diventare un villaggio intelligente:

- Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente.
- Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico.
- Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
- Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica.
- Il comune ha promosso eventi culturali e turistici sostenibili.

Tematiche affrontate:

- Sviluppo sostenibile;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

BOCAIRENT

Bocairent

Bocairent è un comune situato nella comunità autonoma Valenciana, con una popolazione di circa 4.457 abitanti. Localizzato nella valle dell'Alcoià, a 30 km a nord-ovest di Valencia, Bocairent è rinomato per il suo villaggio medievale perfettamente conservato. Il centro storico del villaggio si caratterizza per un labirinto di stradine strette, piazze e fontane, circondato da maestose montagne che offrono spettacolari viste panoramiche. Tra le principali attrazioni turistiche di Bocairent figurano il castello medievale situato su una collina dominante, le grotte artificiali di Covetes dels Moros scavate dai Mori nella roccia, la grotta naturale di Cava de Sant Blai con la sua cappella dedicata a San Biagio, la fontana del XVIII secolo di Sant Roc che ospita una statua del santo, e il Museo Archeologico di Bocairent, che conserva una ricca collezione di reperti storici provenienti dal villaggio e dalle sue vicinanze.
Bocairent rappresenta una rinomata destinazione turistica, apprezzata sia per il suo patrimonio storico e culturale che per la bellezza naturale del paesaggio circostante. Facilmente accessibile da Valencia in treno o in auto, il comune attrae visitatori in cerca di autenticità storica e esperienze culturali immerse in un ambiente paesaggistico incantevole.

Smart Village Bocairent

Il villaggio di Bocairent sta applicando una serie di strategie smart per migliorare la sua condizione periferica e per essere più integrato nell'intorno valenciano. Una delle strategie principali è quella di sviluppare l'economia locale attraverso il turismo e la cultura. Bocairent è un villaggio medievale molto ben conservato, con un centro storico labirintico di stradine strette, piazze e fontane. Il villaggio è anche circondato da montagne, che offrono splendide viste panoramiche. Queste caratteristiche rendono Bocairent una destinazione turistica popolare, sia per i visitatori spagnoli che stranieri. Il villaggio sta anche investendo nella cultura, con una serie di musei, gallerie d'arte e teatri.
Un'altra strategia importante è quella di migliorare la mobilità sostenibile. Bocairent è un villaggio molto verde, con una serie di parchi e giardini. Il villaggio sta anche investendo in una serie di infrastrutture per la mobilità sostenibile, come piste ciclabili e autobus elettrici. Questo renderà più facile per i residenti e i visitatori di spostarsi in città senza usare l'auto.
Infine, Bocairent sta anche investendo nell'istruzione e nella formazione. Il villaggio ha una serie di scuole, asili nido e centri di formazione. Questo renderà più facile per i residenti trovare un lavoro e per i giovani sviluppare le loro competenze.

Dati geografici:

Località: Bocairent, Spagna
Distretto: Valle dell'Alcoià
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 444 metri s.l.m.
Numero di abitanti: 4.457

Dettagli del progetto e obiettivi:

- Migliorare la mobilità sostenibile, investendo in una rete di piste ciclabili e autobus elettrici.
- Sviluppare l'economia locale attraverso il turismo e la cultura, creando nuove attrazioni turistiche e investendo nella cultura.
- Migliorare la qualità della vita dei residenti, investendo nell'istruzione, nella formazione e nei servizi sociali.
- Rendere Bocairent un villaggio più digitale, investendo in infrastrutture e servizi digitali.
- Proteggere l'ambiente, investendo nella sostenibilità ambientale.

Tematiche affrontate:

- Mobilità sostenibile;
- Economia locale;
- Qualità della vita;
- Bocairent digitale ;
- Sostenibilità ambientale.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Chelva

Chelva è un comune spagnolo di 1.489 abitanti situato nella comunità autonoma Valenciana. Si trova nella provincia di Valencia, nella comarca dei Serrans. Chelva è un villaggio medievale molto ben conservato, con un centro storico labirintico di stradine strette, piazze e fontane. Il villaggio è anche circondato da montagne, che offrono splendide viste panoramiche.

Tra le attrazioni turistiche di Chelva ci sono:
- Il castello di Chelva, un castello medievale costruito su una collina che domina il villaggio.
- La Cueva de la Sarsa, una grotta naturale che ospita un museo archeologico.
- La Cueva del Turche, una grotta naturale che ospita un lago sotterraneo.
- Il fiume Turia, che attraversa il villaggio e offre la possibilità di fare escursioni e attività acquatiche.
- Il Museo Archeologico, che ospita una collezione di reperti archeologici provenienti dal villaggio e dai dintorni.
- Chelva è una destinazione turistica popolare, sia per la sua storia e cultura che per la sua bellezza naturale. Il villaggio è facilmente raggiungibile da Valencia in treno o in auto.

Smart Village Chelva

Turismo sostenibile: il comune sta cercando di sviluppare il turismo in modo sostenibile, rispettando l'ambiente e la cultura locale; ha creato una rete di sentieri escursionistici che permettono ai visitatori di esplorare la natura circostante e conoscere la storia e la cultura del villaggio. Ha anche incentivato la creazione di aziende che offrono servizi turistici sostenibili.
Mobilità sostenibile: il comune sta cercando di incentivare l'utilizzo di mezzi pubblici e biciclette; ha creato una rete di piste ciclabili e ha potenziato il servizio di autobus e ha anche incentivato la creazione di aziende che offrono servizi di mobilità sostenibile, come ad esempio il car sharing e il bike sharing.
Innovazione: creazione di una rete wi-fi gratuita, l'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria e lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni.
Cultura: Chelva è un villaggio con una ricca cultura, con un patrimonio storico e artistico importante. Il comune sta promuovendo una serie di eventi culturali, come festival, concerti e mostre, per attirare visitatori e far conoscere la sua cultura. Il comune sta anche investendo nella creazione di nuovi spazi culturali, come ad esempio il Centro Culturale e la Biblioteca.

Dati geografici:

Località: Chelva, Spagna
Distretto: Serrans
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 625 metri s.l.m.
Numero di abitanti: 1.489

Dettagli del progetto e obiettivi:

Nel 2016, Chelva è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Ciò ha permesso di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori: La creazione di una rete wi-fi gratuita; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Un'app per smartphone per esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti; La promozione di eventi culturali e turistici sostenibili. Il progetto "Smart Cities and Communities" ha permesso a Chelva di diventare un villaggio più moderno, sostenibile e innovativo. Progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile; La promozione di attività ricreative e sportive per i giovani; Il miglioramento dei servizi sociali per le persone anziane e disabili.

Tematiche affrontate:

- Turismo sostenibile;
- Mobilità sostenibile;
- Innovazione ;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

CHODOS

Chodos

Chodos è un villaggio situato nella provincia di Teruel, in Spagna. Il villaggio ha una popolazione di circa 246 abitanti e si estende su una superficie di circa 11,6 chilometri quadrati. Il clima di Chodos è mediterraneo, con inverni miti ed estati calde. La storia di Chodos risale al I secolo a.C., quando fu fondato dai romani. Il villaggio fu successivamente conquistato dai bizantini, dai mori e dagli spagnoli. Nel XIII secolo, il villaggio fu conquistato dai cristiani.
Le principali attrazioni turistiche di Chodos sono:
Il Castello di Chodos: un castello medievale situato sul punto più alto del villaggio. La chiesa di San Martín: una chiesa del XIII secolo con un campanile romanico. Il Museo Etnografico di Chodos: un museo che ospita una collezione di oggetti e costumi tradizionali della regione. Il Parco Naturale del Maestrazgo: un parco naturale situato a nord del villaggio.
Chodos è un villaggio con una ricca storia e cultura, che offre ai visitatori una varietà di attrazioni turistiche. Il villaggio è un luogo ideale per chi cerca una vacanza rilassante e tranquilla, ma anche per chi è alla ricerca di attività più avventurose, come l'escursionismo, la speleologia e il turismo rurale.

Smart Village a Chodos

Chodos è un villaggio intelligente (smart village) che ha implementato una serie di strategie per migliorare le sue condizioni e diventare un luogo più sostenibile, innovativo e vivibile.

Alcune delle strategie smart e innovative che Chodos ha attuato includono:

- L'utilizzo di energia solare per alimentare il villaggio.
- L'utilizzo di tecnologie per il risparmio energetico.
- L'utilizzo di tecnologie per la gestione dei rifiuti.
- L'utilizzo di tecnologie per la mobilità sostenibile.
- L'utilizzo di tecnologie per la sicurezza e la protezione civile.
- L'utilizzo di tecnologie per la cultura e l'intrattenimento.
- L'utilizzo di tecnologie per l'amministrazione comunale.

Dati geografici:

Località: Chodos, Spagna
Distretto: Maestrazgo
Regione: Aragona
Lingua: Spagnolo
Orario: UTC+1:00
Altitudine: 1.160 metri s.l.m.
Numero di abitanti: 145

Dettagli del progetto e obiettivi:

Queste strategie hanno permesso a Chodos di diventare un villaggio più moderno, sostenibile e innovativo. Il villaggio è un modello per altri villaggi in Spagna e in Europa, che possono imparare da Chodos come diventare più smart.

I principali obiettivi futuri di Chodos sono:

- Diventare un villaggio ancora più sostenibile, utilizzando energie rinnovabili, riducendo il consumo di energia e migliorando la gestione dei rifiuti.
- Diventare un villaggio ancora più innovativo, utilizzando tecnologie per migliorare la qualità della vita dei suoi abitanti e dei suoi visitatori.
- Diventare un villaggio ancora più vivibile, creando un ambiente sicuro, confortevole e attrattivo per i suoi abitanti e per i suoi visitatori.

Tematiche affrontate:

- Sostenibilità;
- Innovazione ;
- Vivibilità;
- Recupero e valorizzazione.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

CHULILLA

Chulilla

Chulilla è un villaggio situato nella provincia di Valencia, in Spagna. Il villaggio ha una popolazione di circa 3.200 abitanti e si estende su una superficie di circa 10 chilometri quadrati. Il clima di Chulilla è mediterraneo, con inverni miti ed estati calde. La storia di Chulilla risale al I secolo a.C., quando fu fondata dai romani. Il villaggio fu successivamente conquistato dai bizantini, dai mori e dagli spagnoli. Nel XVIII secolo, il villaggio fu gravemente danneggiato da un terremoto.

Le principali attrazioni turistiche di Chulilla sono:
Il Castello di Chulilla: un castello medievale situato sul punto più alto del villaggio.
Le gole del Turia: delle gole scavate dal fiume Turia, che si trovano a pochi chilometri dal villaggio.
Le grotte di Chulilla: delle grotte naturali che si trovano a pochi chilometri dal villaggio.
Il centro storico di Chulilla: un centro storico medievale con stradine strette e case antiche.

Smart Village Chulilla

Chulilla è un villaggio intelligente (smart village) che ha implementato una serie di strategie per migliorare le sue condizioni e diventare un luogo più sostenibile, innovativo e vivibile.

Alcune delle strategie smart e innovative che Chulilla ha attuato includono:

- L'utilizzo di energia solare per alimentare il villaggio.
- L'utilizzo di tecnologie per il risparmio energetico.
- L'utilizzo di tecnologie per la gestione dei rifiuti.
- L'utilizzo di tecnologie per la mobilità sostenibile.
- L'utilizzo di tecnologie per la sicurezza e la protezione civile.
- L'utilizzo di tecnologie per la cultura e l'intrattenimento.
- L'utilizzo di tecnologie per l'amministrazione comunale.

Dati geografici:

Località: Chulilla, Spagna
Distretto: Camp de Túria
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 547 metri s.l.m.
Numero di abitanti: 751

Dettagli del progetto e obiettivi:

I principali obiettivi futuri di Chulilla sono:

- Diventare un villaggio ancora più sostenibile, utilizzando energie rinnovabili, riducendo il consumo di energia e migliorando la gestione dei rifiuti.
- Diventare un villaggio ancora più innovativo, utilizzando tecnologie per migliorare la qualità della vita dei suoi abitanti e dei suoi visitatori.
- Diventare un villaggio ancora più vivibile, creando un ambiente sicuro, confortevole e attrattivo per i suoi abitanti e per i suoi visitatori.

Tematiche affrontate:

- Sostenibilità
- Innovazione
- Sicurezza

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

CULLA

Culla

Culla è un comune spagnolo di 293 abitanti situato nella comunità autonoma Valenciana.
Si trova nella provincia di Castellón, nella comarca di l'Alt Maestrat.
Culla è un comune situato nella Sierra d'Espadà, a circa 100 chilometri da Valencia.
Il comune è composto da un unico centro abitato.
Culla è un comune con una ricca storia e cultura.
Ecco alcune delle attrazioni turistiche più popolari di Culla:

Il castello di Culla: un castello medievale situato sul punto più alto del comune.
La chiesa di Santa Maria la Major: una chiesa del XIV secolo.
Il centro storico di Culla: un centro storico medievale con stradine strette e case antiche.
Il Museo del Vino: un museo dedicato alla storia della viticoltura nella regione.
Il Parco Naturale della Sierra d'Espadà: un parco naturale situato a nord del comune.

Smart Village Culla

Nel 2020, Culla è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti; La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Culla di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile;
La promozione di attività ricreative e sportive per i giovani; Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Culla, Spagna
Distretto: Alt Maestrat
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 547 metri s.l.m.
Numero di abitanti: 733

Dettagli del progetto e obiettivi:

Ecco alcuni esempi specifici delle strategie smart e innovative che Culla ha attuato per migliorare le sue condizioni e diventare un villaggio intelligente:
Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente. Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico. Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso. Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica. Il comune ha promosso eventi culturali e turistici sostenibili. Questo ha contribuito a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Tematiche affrontate:

- Sostenibilità;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Denia

Dénia è un villaggio situato nella provincia di Valencia, in Spagna. Il villaggio ha una popolazione di circa 43.000 abitanti e si estende su una superficie di circa 70 chilometri quadrati. Il clima di Dénia è mediterraneo, con inverni miti ed estati calde. La storia di Dénia risale al VII secolo a.C., quando fu fondata dai fenici. Il villaggio fu successivamente conquistato dai romani, dai bizantini, dai mori e dagli spagnoli. Nel XIII secolo, il villaggio fu conquistato dai cristiani. Le principali attrazioni turistiche di Dénia sono:

- La spiaggia di Denia: una lunga spiaggia di sabbia bianca situata sul Mar Mediterraneo.
- Il centro storico di Denia: un centro storico medievale con stradine strette e case antiche.
- Il castello di Denia: un castello medievale situato sul punto più alto del villaggio.
- Il Museo Archeologico di Denia: un museo che ospita una collezione di reperti archeologici provenienti da Dénia e dalla regione circostante.
- Il Parco Naturale del Montgó: un parco naturale situato a nord di Dénia.

Smart Village Denia

Alcune delle strategie smart e innovative che Dénia ha attuato includono:

- L'utilizzo di energia solare per alimentare il villaggio.
- L'utilizzo di tecnologie per il risparmio energetico.
- L'utilizzo di tecnologie per la gestione dei rifiuti.
- L'utilizzo di tecnologie per la mobilità sostenibile.
- L'utilizzo di tecnologie per la sicurezza e la protezione civile.
- L'utilizzo di tecnologie per la cultura e l'intrattenimento.
- L'utilizzo di tecnologie per l'amministrazione comunale.

Dati geografici:

Località: Dénia, Spagna
Distretto: Marina Alta
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 73 metri s.l.m.
Numero di abitanti: 44.464

Dettagli del progetto e obiettivi:

Alcuni dei benefici che Dénia ha ottenuto dalle sue strategie smart e innovative includono:

- Una riduzione del consumo di energia.
- Una riduzione delle emissioni di gas serra.
- Un miglioramento della qualità dell'aria.
- Un miglioramento della qualità della vita dei residenti.
- Un aumento dell'attrattività turistica.

Tematiche affrontate:

- Sostenibilità;
- Energia;
- Qualità della vita;
- Turismo.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

GUADALEST

Guadalest

Guadalest è un comune spagnolo situato nella comunità autonoma Valenciana, nella provincia di Alicante.
Il villaggio si trova in una valle circondata da montagne ed è famoso per il suo castello, il lago, le grotte e le sue case tradizionali.
Guadalest è una delle destinazioni turistiche più popolari della Comunità Valenciana e attira ogni anno migliaia di visitatori.
Ecco alcune delle attrazioni turistiche più importanti di Guadalest:

Il castello di Guadalest: il castello si trova su una collina che domina il villaggio e offre splendide viste panoramiche.
Il lago di Guadalest: il lago è stato creato artificialmente nel XX secolo e si trova nel cuore del villaggio.
Le grotte di Guadalest: le grotte sono un complesso di grotte naturali che si trovano nella montagna che sovrasta il villaggio.
Le case tradizionali di Guadalest: le case del villaggio sono costruite in pietra e legno e presentano uno stile tradizionale valenciano.

Smart Village Guadalest

Una delle strategie principali è quella di sviluppare l'economia locale attraverso il turismo e la cultura. Guadalest è un villaggio molto pittoresco e affascinante, con un ricco patrimonio storico e culturale. Il villaggio sta investendo in una serie di progetti per migliorare l'offerta turistica, come la creazione di nuovi sentieri escursionistici, la costruzione di un nuovo centro congressi e la promozione di eventi culturali.

Un'altra strategia importante è quella di migliorare la mobilità sostenibile. Guadalest è un villaggio molto piccolo e facilmente accessibile a piedi o in bicicletta. Il villaggio sta investendo in una serie di infrastrutture per la mobilità sostenibile, come la creazione di una rete di piste ciclabili e la sostituzione dei mezzi pubblici con mezzi elettrici.

Infine, Guadalest sta anche investendo nell'istruzione e nella formazione. Il villaggio ha una serie di scuole, asili nido e centri di formazione. Questo renderà più facile per i residenti trovare un lavoro e per i giovani sviluppare le loro competenze.

Dati geografici:

Località: Guadalest, Spagna
Distretto: Marina Baixa
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 625 metri s.l.m.
Numero di abitanti: 215

Dettagli del progetto e obiettivi:

Guadalest è una destinazione turistica popolare, nota per il suo castello, il lago e le sue case tradizionali. Il villaggio sta investendo in una serie di progetti per migliorare l'offerta turistica e diventare un villaggio all'avanguardia.
Alcuni dei progetti in corso includono:
La costruzione di un nuovo centro congressi;

- La creazione di un nuovo percorso escursionistico;
- La promozione di eventi culturali;
- L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria;
- La creazione di una rete wi-fi gratuita in tutto il villaggio;
- L'implementazione di un sistema di raccolta differenziata dei rifiuti;
- Sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni;
- Creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie.

Tematiche affrontate:

- Turismo
- Sostenibilità
- Innovazione
- Cultura

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Jerica

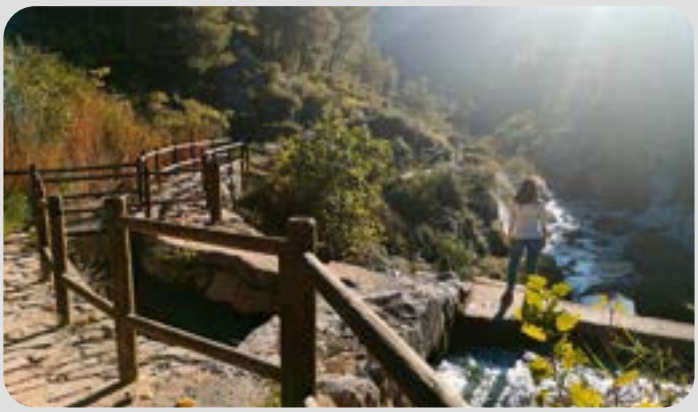
Situata nella regione dell'Alto Palancia , Jérica è una di quelle cittadine affascinanti che ti catturano fin dal primo momento e ti fanno sentire parte della sua gente e delle sue tradizioni. È una città piena di vita e bellezza. Un luogo che merita di essere visitato e goduto.
La storia ha lasciato una grande impronta nell'architettura, nelle strade e negli edifici della città, trasformando il suo centro storico in un Bene di Interesse Culturale (BIC). Lo stesso paesaggio roccioso ha formato intorno ad esso un precipizio quasi inaccessibile che funge da muro naturale per la parte superiore del castello.

La vuelta de la Hoz

Accanto alla città di Jérica, nella provincia di Castellón , troviamo l' area naturale di La Vuelta de la Hoz . È un meandro del fiume Palancia, un fiume che nel tempo ha eroso la montagna e ha creato, su entrambi i lati, una gola alta più di 50 metri. Dal 2006 l'alveo del fiume è stato condizionato per diventare luogo di svago e riposo ; Parte del percorso dei fossi è utilizzato per creare un'area giochi per bambini e un'area pic-nic. Uno dei problemi de La Vuelta de Hoz era la difficoltà di accesso, una sfida che è stata risolta con la costruzione di una passerella che costeggia il meandro che corre tra Peña Tajada e il pendio della Cueva de los Herreros. Il sentiero inizia, sul lato ovest, a Los Chorradores e poi prosegue attraverso la pineta esistente sotto la Torreta e termina nell'area ricreativa vicino al Puente de Navarza . Puoi anche fare il percorso inverso e accedere alla Vuelta de Hoz attraversando il fiume Palancia sul ponte Navarza. Lungo tutto il percorso si incontrano zone di arrampicata molto apprezzate dagli atleti; torri come la Torre del Homenaje e il taglio della montagna che fungeva da muro naturale al Castello di Jérica . Una zona che ha molto da offrire e che ci invita a trascorrere una giornata di relax e tranquillità, scoprendo paesaggi incredibili dell'Alto Palancia e sentendo da vicino la bellezza della natura.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 523 metri s.l.m.
Numero di abitanti: 1.561



Dettagli del progetto e obiettivi:

Miglioramento dell'efficienza energetica. Il comune investirà in tecnologie per migliorare l'efficienza energetica dei edifici pubblici e privati. Questo includerà l'installazione di pannelli solari, l'illuminazione a LED e la gestione intelligente dei rifiuti.
Sviluppo di un sistema di mobilità sostenibile. Il comune investirà in trasporti pubblici sostenibili, come autobus elettrici e biciclette. Inoltre, creerà una rete di percorsi ciclabili e pedonali per rendere più facile spostarsi in città senza usare un'auto.
Miglioramento dei servizi pubblici. Il comune investirà in tecnologie per migliorare i servizi pubblici, come l'illuminazione stradale, la raccolta dei rifiuti e la manutenzione delle strade. Questo includerà l'installazione di sensori per monitorare il traffico e la qualità dell'aria.
Sviluppo di una comunità più partecipativa. Il comune investirà in tecnologie per coinvolgere i cittadini nel processo decisionale. Questo includerà la creazione di un sito web per il governo partecipativo e l'uso di social media per condividere informazioni e chiedere feedback.

Tematiche affrontate:

- Turismo rurale;
- Sentieri naturalistici.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

MONTANEJOS

Montanejos

Montanejos è un villaggio situato nella provincia di Castellón, in Spagna. Il villaggio ha una popolazione di circa 1.400 abitanti e si estende su una superficie di circa 50 chilometri quadrati. Il clima di Montanejos è mediterraneo, con inverni miti ed estati calde. La storia di Montanejos risale al I secolo a.C., quando fu fondato dai romani. Il villaggio fu successivamente conquistato dai bizantini, dai mori e dagli spagnoli.
Le principali attrazioni turistiche di Montanejos sono:
Le cascate: il villaggio di Montanejos è famoso per le sue cascate, le più famose delle quali sono le Cascadas del Salto.
Le terme: Montanejos è anche un famoso centro termale, le cui acque sono ricche di minerali e hanno proprietà curative.
Le attività all'aria aperta: Montanejos è un luogo ideale per le attività all'aria aperta, come l'escursionismo, il ciclismo, il rafting e il kayak.
Montanejos è un villaggio con una ricca storia e cultura, che offre ai visitatori una varietà di attrazioni turistiche. Il villaggio è un luogo ideale per chi cerca una vacanza rilassante e tranquilla, ma anche per chi è alla ricerca di attività più avventurose.

Smart Village Montanejos

L'utilizzo di energia solare per alimentare il villaggio. Montanejos è il primo villaggio in Spagna ad essere alimentato al 100% da energia solare. L'utilizzo di tecnologie per il risparmio energetico tra cui l'illuminazione intelligente, la gestione remota degli edifici e il controllo dei consumi. L'utilizzo di tecnologie per la gestione dei rifiuti. Ha implementato un sistema di raccolta differenziata dei rifiuti e un sistema di compostaggio dei rifiuti organici. L'utilizzo di tecnologie per la mobilità sostenibile. Montanejos ha promosso l'utilizzo della mobilità sostenibile, offrendo ai suoi cittadini e ai suoi visitatori una serie di servizi e infrastrutture, tra cui una rete di piste ciclabili, un servizio di trasporto pubblico elettrico e un sistema di car sharing. L'utilizzo di tecnologie per la sicurezza e la protezione civile. Montanejos ha implementato un sistema di video sorveglianza e un sistema di allarme antincendio. L'utilizzo di tecnologie per la cultura e l'intrattenimento. Ha creato una piattaforma digitale per la cultura e l'intrattenimento, che offre ai suoi cittadini e ai suoi visitatori una serie di eventi, attività e servizi culturali. L'utilizzo di tecnologie per l'amministrazione comunale. Ha implementato un sistema di e-government, che offre ai suoi cittadini e ai suoi visitatori una serie di servizi online, tra cui la possibilità di pagare le tasse, richiedere certificati e prenotare appuntamenti.

Dati geografici:

Località: Montanejos, Spagna
Distretto: Alto Mijares
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+1:00
Altitudine: 725 metri s.l.m.
Numero di abitanti: 414

Dettagli del progetto e obiettivi:

Queste strategie hanno permesso a Montanejos di diventare un villaggio più moderno, sostenibile e innovativo. Il villaggio è un modello per altri villaggi in Spagna e in Europa, che possono imparare da Montanejos come diventare più smart.

I principali obiettivi futuri di Montanejos sono:

- Diventare un villaggio ancora più sostenibile, utilizzando energie rinnovabili, riducendo il consumo di energia e migliorando la gestione dei rifiuti.
- Diventare un villaggio ancora più innovativo, utilizzando tecnologie per migliorare la qualità della vita dei suoi abitanti e dei suoi visitatori.
- Diventare un villaggio ancora più vivibile, creando un ambiente sicuro, confortevole e attrattivo per i suoi abitanti e per i suoi visitatori.

Tematiche affrontate:

- Energia sostenibile;
- Uso di fonti rinnovabili;
- Innovazione;
- Tecnologia ;
- Digitale.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Morella

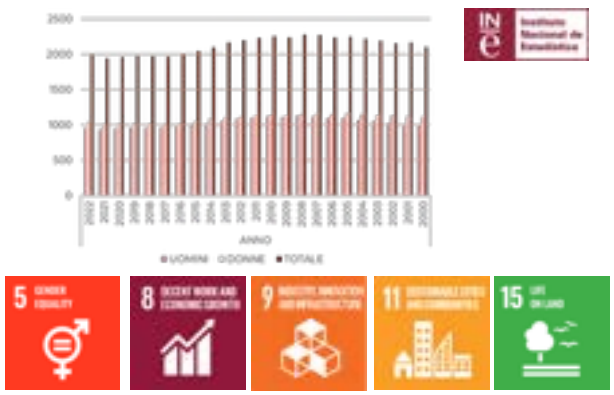
Nel nord della Comunità Valenciana, a 1000 metri sul livello del mare, Morella si trova all'interno di un'area di oltre 400 km², di cui oltre il 78% è protetto come parte della Rete Natura 2000. Qui troviamo aree di protezione speciale per gli uccelli, luoghi di interesse comunitario come fiumi, microriserve o il Parco Naturale di Pereroles.
Morella è custode di inestimabili pezzi di storia; è circondato da quasi 2 chilometri di mura ed è coronato da un imponente castello, entrambi classificati Monumenti Nazionali e la cui posizione conferisce loro anche la particolarità di un paesaggio spettacolare. Il castello monumentale ha un Master Plan redatto dal Ministero della Cultura, mentre il comune concede un budget annuale e riceve investimenti dall'amministrazione spagnola.

Morella Smart Village

Il suo ricco patrimonio permette di presentare un'offerta attraente e variegata, dai siti paleontologici di grande importanza, come le pitture rupestri levantine e le costruzioni in pietra a secco, entrambi Patrimonio dell'Umanità, alla città visigota, centri rurali molto attraenti, fattorie storiche con resti medievali, eremi o tratturi. Di tutti, 41 hanno una distinzione di protezione spagnola denominata BIC (Bene di Interesse Culturale) e 29 Beni di Rilevanza Locale. La gestione di questo patrimonio culturale ha ricevuto un riconoscimento europeo con due premi Europa Nostra. Inoltre, le città spagnole Patrimonio dell'Umanità hanno conferito al comune il Premio Patrimonio 2011 per la loro gestione. Ci sono vari festival ed espressioni culturali che godono anche di riconoscimento nazionale.
Una gestione basata sulla prossimità è stata essenziale per sviluppare iniziative e progetti di riabilitazione e insegnare l'importanza del patrimonio agli abitanti e ai visitatori. Grazie all'accordo del comune con il governo spagnolo, il comune si fa carico del castello e delle mura, promuovendo così progetti di recupero e visite ai monumenti stessi, creando occupazione.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 15 metri s.l.m.
Numero di abitanti: 2.715



Dettagli del progetto e obiettivi:

Conservare il patrimonio storico e culturale di Morella. Il Comune di Morella ha stanziato fondi per il restauro del Castello di Morella, della Cattedrale di Morella, e delle mura di Morella. Il Comune ha anche creato un museo storico e culturale per preservare la storia e la cultura della città.
Rinforzare l'economia locale. Il Comune di Morella ha stanziato fondi per l'attrazione di nuovi investimenti nella città. Il Comune ha anche creato un programma di incentivi per le imprese che si insediano a Morella.
Migliorare la qualità della vita dei residenti. Il Comune di Morella ha stanziato fondi per l'ammodernamento delle scuole, degli ospedali, e dei servizi pubblici. Il Comune ha anche creato un programma di assistenza sociale per le persone in difficoltà.
Proteggere l'ambiente. Il Comune di Morella ha stanziato fondi per la riduzione dell'inquinamento, la protezione della biodiversità, e la promozione della sostenibilità. Il Comune ha anche creato un programma di educazione ambientale per i cittadini.

Tematiche affrontate:

- Integrazione sociale;
- Morella Verde;
- Prodotti enogastronomici;
- Uso dell'aerotermia.

*Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

NUEVA TABARCA

Nueva Tabarca

Piccola isola situata nel Mar Mediterraneo, al largo della costa di Alicante, nella Comunità Valenciana, Spagna:

Superficie: 1,86 km²
Popolazione: 58 abitanti (2020)
Clima: Mediterraneo, con inverni miti ed estati calde
Storia: L'isola fu colonizzata dai cartaginesi nel III secolo a.C. e fu successivamente conquistata dai romani, dai bizantini, dai mori e dagli spagnoli. Nel 1738, l'isola fu popolata da pescatori genovesi, che costruirono il villaggio attuale.
Attrazioni turistiche: Le principali attrazioni turistiche di Nueva Tabarca sono:
La spiaggia: l'isola ha una sola spiaggia, lunga circa 1 chilometro e mezzo.
Il villaggio: il villaggio è composto da un'unica strada principale, che è fiancheggiata da case bianche e blu.
Il faro: il faro è situato sulla punta nord dell'isola.
Le grotte: l'isola è ricca di grotte, alcune delle quali sono visitabili.

Smart Village Nueva Tabarca

Il villaggio ha attuato una serie di strategie smart e innovative per migliorare le sue condizioni e diventare un villaggio intelligente. Alcune di queste strategie includono:

L'utilizzo di energia solare per alimentare il villaggio. Il villaggio è alimentato da energia solare al 100%, il che lo rende uno dei villaggi più sostenibili d'Europa.
L'utilizzo di tecnologie per il risparmio energetico. Il villaggio utilizza tecnologie per il risparmio energetico, come lampadine a LED e termostati intelligenti, che hanno contribuito a ridurre il consumo di energia del villaggio del 30%.
L'utilizzo di tecnologie per la gestione dei rifiuti. Il villaggio utilizza tecnologie per la gestione dei rifiuti, come sistemi di raccolta differenziata e compostaggio, che hanno contribuito a ridurre la quantità di rifiuti inviati in discarica del 70%.
L'utilizzo di tecnologie per la mobilità sostenibile. Il villaggio è dotato di una rete di piste ciclabili e di un sistema di trasporto pubblico elettrico, che hanno reso più facile e sostenibile spostarsi nel villaggio.

Dati geografici:

Località: Nueva Tabarca, Spagna
Distretto: Alicante
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 2 metri s.l.m.
Numero di abitanti: 68

Dettagli del progetto e obiettivi:

Nueva Tabarca intende intraprendere una serie di strategie in futuro per consolidare il suo status di villaggio intelligente e sostenibile. Queste strategie includono: L'ampliamento dell'utilizzo di energie rinnovabili. Il villaggio intende aumentare la quota di energia solare e eolica nella sua produzione energetica, e sta già studiando l'utilizzo di altre fonti rinnovabili, come l'energia mareomotrice. L'ulteriore sviluppo della mobilità sostenibile. Il villaggio intende ampliare la rete di piste ciclabili e di trasporto pubblico elettrico, e sta anche studiando l'utilizzo di veicoli a guida autonoma.
L'implementazione di nuovi sistemi di gestione dei rifiuti. Il villaggio intende implementare nuovi sistemi di raccolta differenziata e compostaggio, e sta anche studiando l'utilizzo di tecnologie per il riciclo e il recupero di materiali.
La promozione di attività sostenibili. Il villaggio intende promuovere attività sostenibili, come l'agricoltura biologica, la pesca sostenibile e il turismo sostenibile.

Tematiche affrontate:

- Sostenibilità;
- Innovazione;
- Energie rinnovabili;
- Mobilità sostenibile;
- Raccolta differenziata;
- Agricoltura biologica e pesca sostenibile
- Turismo.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Sagunto

Sagunto si trova nella provincia di Valencia, nella comunità autonoma Valenciana. È situata a circa 30 chilometri a sud di Valencia, sulla costa del Mediterraneo.
Popolazione: Sagunto ha una popolazione di circa 65.000 abitanti.
Clima: Il clima di Sagunto è mediterraneo, con inverni miti ed estati calde.
Storia: Sagunto è un antico insediamento romano, che fu fondato nel 218 a.C. Dal 133 a.C. fino al 711 d.C., Sagunto fu una colonia romana. Dopo la conquista islamica, Sagunto fu un importante centro commerciale e culturale. Nel 1238, Sagunto fu riconquistata dai cristiani.
Attrazioni turistiche: Le principali attrazioni turistiche di Sagunto sono:
Il Castello di Sagunto: un castello medievale che domina la città.
Il Teatro Romano di Sagunto: un teatro romano del I secolo d.C.
Il Museo Archeologico di Sagunto: un museo che ospita una collezione di reperti archeologici provenienti da Sagunto e dalla regione circostante.
La spiaggia di Sagunto: una lunga spiaggia di sabbia bianca situata sul Mar Mediterraneo.

Smart Village Sagunto

- L'installazione di una rete wi-fi gratuita in tutta la città. Questa rete wi-fi è disponibile per i residenti e i visitatori e consente loro di connettersi a Internet gratuitamente.
- L'utilizzo di sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questa tecnologia consente al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico.
- Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare la città e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
- La promozione di eventi culturali e turistici sostenibili. Questi eventi contribuiscono a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Dati geografici:

Località: Sagunto, Spagna
Distretto: Camp de Morvedre
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 130 metri s.l.m.
Numero di abitanti: 62.702

Dettagli del progetto e obiettivi:

- La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie. Questo centro sarà un luogo in cui le aziende e gli imprenditori potranno collaborare per sviluppare nuovi prodotti e servizi.
- L'implementazione di un sistema di trasporto pubblico sostenibile. Questo sistema includerà autobus elettrici e biciclette a noleggio, che contribuiranno a ridurre l'inquinamento atmosferico.
- La promozione di attività ricreative e sportive per i giovani. Queste attività contribuiranno a migliorare la qualità della vita dei giovani e a ridurre il tasso di criminalità.
- Il miglioramento dei servizi sociali per le persone anziane e disabili. Questi servizi contribuiranno a migliorare la qualità della vita delle persone anziane e disabili e a garantire loro una vita dignitosa.

Tematiche affrontate:

- Sostenibilità;
- Innovazione;
- Cultura;
- Storia;
- Tradizione.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

SAN MATEO

San Mateo

San Mateo è stata storicamente la capitale del Castellón Maestrazgo ed è un comune situato nella parte interna della provincia di Castellón. Pur essendo una città dell'interno rurale, la sua vicinanza al mare le ha sempre permesso di trovarsi tra i due ambienti: quello dell'entroterra, con montagne selvagge e un paesaggio verde, frondoso e montuoso, e dopo aver percorso solo pochi chilometri , raggiungere la zona costiera e le spiagge di Vinaròs , Benicarló e Peñíscola .

Il suo territorio comunale permette di godere di un abbondante numero di sorgenti d'acqua cristallina e piccoli corsi d'acqua , le cui acque sfociano solitamente nella Rambla de Cervera , il corso d'acqua principale della città. I diversi percorsi escursionistici che attraversano la zona di San Mateo permettono di conoscere bene queste sorgenti e ruscelli, permettendo di vivere appieno la natura di un bosco mediterraneo vicino al mare. Inoltre, ha dettagli che ci avvicinano alla zona di El Ports, più montuosa e con un carattere diverso.

Complesso rurale a TURIMAESTRAT

Alloggio rurale Turimaestrat è un complesso rurale situato nel Maestrazgo, nell'entroterra di Castellón. Nel centro storico di Sant Mateu, Turimaestrat offre alloggio per grandi gruppi: amici, famiglie, riunioni di lavoro.
Complesso di cohousing turistico volto alla fruizione del territorio rurale, con appartamenti afferenti a sale comuni per la condivisione delle attività.
Tra le attività proposte, visite escursionistiche, impianti sportivi, gite a cavallo, fiere medievali locali, degustazione di prodotti tipici, visita al Parco di Tinença de Benifassa, campi da golf, parchi avventura, cicloturismo, feste popolari, raccolta di prodotti interni, laboratori di pittura, piscine, laboratori di danza e meditazione, elaborazione di formaggi artigianali e degustazione di formaggi, eventi extra.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 15 metri s.l.m.
Numero di abitanti: 2.187

Dettagli del progetto e obiettivi:

Conservare la cultura e le tradizioni del villaggio. Il Villaggio di San Mateo è un luogo ricco di storia e cultura, ed è importante preservare queste tradizioni per le generazioni future.
Rinforzare l'economia locale. Il Villaggio di San Mateo è un importante centro economico per la regione, e il Consiglio del Villaggio sta lavorando per migliorare l'economia locale in una serie di modi, come attrarre nuovi investimenti, creare posti di lavoro, e migliorare le infrastrutture.
Migliorare la qualità della vita dei residenti. Il Consiglio del Villaggio di San Mateo è impegnato a migliorare la qualità della vita dei residenti, e sta lavorando per una serie di obiettivi, come migliorare l'istruzione, l'assistenza sanitaria, e i servizi pubblici.
Proteggere l'ambiente. Il Villaggio di San Mateo è un luogo bellissimo, ed è importante proteggere l'ambiente per le generazioni future. Il Consiglio del Villaggio sta lavorando per ridurre l'inquinamento, proteggere la biodiversità, e promuovere la sostenibilità.

Tematiche affrontate:

- Cohousing;
- Turismo rurale;
- Complessi turistici.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Sax

Sax è un comune spagnolo di 12.825 abitanti situato nella comunità autonoma Valenciana. Si trova nella provincia di Alicante, nella comarca di l'Alacantí. Sax è un villaggio situato nel cuore della provincia di Alicante, a circa 40 chilometri dalla costa. Il villaggio è circondato da montagne e offre splendidi panorami. Sax è un villaggio con una ricca storia e cultura. Il villaggio è famoso per la sua ceramica, che è prodotta qui da secoli. Sax è anche un importante centro religioso, sede dell'abbazia di Santa María la Real. Il villaggio è una destinazione turistica popolare, sia per la sua bellezza naturale che per la sua ricchezza culturale.
Ecco alcune delle attrazioni turistiche più popolari di Sax:

L'abbazia di Santa María la Real: un'abbazia cistercense del XII secolo.
Il Museo della ceramica di Sax: un museo che espone una collezione di ceramiche di Sax.
Il centro storico di Sax: un centro storico medievale con stradine strette e case antiche.
La chiesa di San Agustín: una chiesa del XVI secolo.
La chiesa di San Francisco: una chiesa del XVII secolo.

Smart Village Sax

Nel 2016, Sax è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti; La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Sax di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile;
La promozione di attività ricreative e sportive per i giovani; Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Sax, Spagna
Distretto: Vinalopó Mitjà
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 625 metri s.l.m.
Numero di abitanti: 10.054

Dettagli del progetto e obiettivi:

Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente.
Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico.
Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica.
Il comune ha promosso eventi culturali e turistici sostenibili. Questo ha contribuito a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Tematiche affrontate:

- Sostenibilità;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

SEGORBE

Segorbe

L'enclave strategica di Segorbe, accanto al fiume Palancia, sul percorso naturale che collega la costa con gli altopiani di Teruel e su un'ampia scogliera, la collina Sopeña, che si protende nella valle, fertilizzata da abbondanti sorgenti e sorgenti, hanno ha trasformato questa collina nel corso della storia nel fulcro delle culture e nel sito della popolazione. La sua forma a pianoro, con ripidi pendii che facilitano una perfetta difesa da possibili nemici e il suo dominio sulla vallata che lo circonda, fanno di questo rilievo una posizione strategica imbattibile, che ha determinato che la vetta fosse stabilmente occupata fin dalla Preistoria. Sebbene le dimensioni degli edifici successivi costruiti sulla sommità abbiano nascosto o distrutto i livelli più antichi,
Segorbe ha svolto in passato un ruolo importante nella Corona d'Aragona. Di qui passarono gli eserciti del re D. Jaime in marcia verso Valencia, dove conobbe Cortés e vi risiedette e ricevette sostegno il nipote del re D. Martín "El Humano", D. Fadrique, uno dei pretendenti alla Corona d'Aragona nel conflitto risolto dal Compromesso di Caspe a favore di Fernando de Antequera.

CENTRO DI INTERPRETAZIONE DI TORI E CAVALLI

Il Centro offre un'esperienza turistica unica, dedicata a uno spettacolo mozzafiato riconosciuto come Festival di Interesse Turistico Internazionale. Il tour guidato permette di esplorare i vari momenti della La Entrada, una manifestazione carica di emozioni e rischi che attira migliaia di visitatori ogni anno a Segorbe. Durante il tour, i visitatori scoprono gli scenari principali dell'evento: La Tria de Toros nella Palancia, la Salita attraverso il Rialé, La Reunion, La Carrera, l'arrivo alla Plaza, e la brillante sfilata di cavalieri. Questo tradizionale evento, risalente al XIV secolo, si svolge ogni giorno alle 14:00 durante la seconda settimana delle feste patronali di Segorbe. Il razzo che segna l'inizio dell'Entrata risuona nella via del Argén, mentre i tori raggiungono la piazza de los Mesones, dove coraggiosi cavalieri li circondano per guidarli in un'entusiasmante corsa fino all'arena. Il percorso di circa 500 metri lungo la via Colón offre una vista ravvicinata degli animali senza barriere tra loro e il pubblico, creando un corridoio di sicurezza in cui la folla si apre e si chiude dinanzi all'avanzare dei tori e dei cavalli. Le festività sono arricchite da una varietà di eventi tra cui sagre, concerti, concorsi e spettacoli pirotecnici, rendendo Segorbe una destinazione imperdibile per chi cerca tradizione, emozione e cultura durante le celebrazioni annuali.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 358 metri s.l.m.
Numero di abitanti: 9.244

Dettagli del progetto e obiettivi:

- La creazione di un nuovo centro di interpretazione della corrida, che sarà ospitato nell'ex Palazzo Municipale, un edificio storico del XVIII secolo. Il centro sarà dotato di una biblioteca, di un auditorium, di una sala espositiva e di un laboratorio didattico.
- La realizzazione di un nuovo parco urbano con giochi e attrazioni per bambini e famiglie.
- L'organizzazione di eventi e festival culturali e gastronomici durante tutto l'anno.
- Il potenziamento della segnaletica turistica e la creazione di nuovi itinerari turistici.
- La promozione del villaggio sui social media e sui siti web turistici.

Tematiche affrontate:

- Tradizioni popolari.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Serra

Serra, nel cuore del Parco Naturale della Serra Calderona , è una mecca per l'escursionismo , poiché il suo territorio è ricco di grandi e piccoli percorsi in paesaggi incredibili dove puoi trovare punti panoramici, fontane e monumenti inaspettati.
Torri difensive punteggiano il paesaggio di Serra, sia nell'area urbana, come la Torre del Senyor, del IX secolo e di origine islamica , sia nei dintorni, come la Torre de la Ermita o la Ria o la Torre di Satarena .
Serra si distingue anche per le sue numerose fontane , a partire dalla fontana Salud nel centro del paese e proseguendo con Deula, Potrillos, Sant Josep, Sant Antoni, Marianet, l'Ombria, Llentiscle, Poll, Berro, Marge, dalla Gout.
Un'altra grande attrattiva della Serra sono i suoi punti panoramici, come il Garbí , che offrono viste incredibili su questo magnifico entroterra che è Calderona.
Uno dei paesaggi più spettacolari di Serra è quello della Cartuja de Portaceli , in una vallata, con un acquedotto gotico del XV secolo e circondata da aranceti. Anche se non è visitabile, vale la pena fare un percorso per avere una vista panoramica.

Il pellet e l'economia circolare

Il pellet prodotto nell'impianto a biomasse di proprietà del Comune di Serra ha ottenuto la certificazione del marchio Parc Natural de la Serra Calderona Producte Natural . Il marchio è un distintivo concesso dalla Direzione Generale degli Spazi Naturali a prodotti naturali, artigiani e altre attività come il turismo naturalistico che vengono ottenuti, prodotti o forniti all'interno dell'area di influenza socioeconomica dei parchi naturali della Comunità Valenciana .
Il pellet è ottenuto dalla biomassa proveniente dalla potatura e pulizia dell'area forestale della pubblica utilità monte 105 Alto Pino che appartiene al Comune di Serra. Una biomassa che una volta trasferita all'impianto di trasformazione diventa pellet . Un combustibile utilizzato per alimentare le caldaie di riscaldamento del CEIP Sant Josep , dell'Escoleta Infantil Municipal e del municipio di Serra e del Centro medico. Inoltre, il consiglio comunale vende il surplus di produzione al quartiere , che lo utilizza per alimentare le stufe o le caldaie installate nelle proprie abitazioni. Serra è un comune pioniere nel settore delle energie rinnovabili da biomassa e della sua trasformazione in pellet . Un'attività in sinergia con approcci di gestione forestale sostenibile e di lotta agli incendi boschivi e al cambiamento climatico . Un progetto di economia circolare che pone il comune in prima linea nella gestione comunale delle risorse forestali.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 330 metri s.l.m.
Numero di abitanti: 2.004

Dettagli del progetto e obiettivi:

- Sostegno finanziario alle aziende produttrici di pellet. L'Ajuntament de Serra offre un contributo finanziario alle aziende produttrici di pellet che investono in nuove tecnologie o che ampliano la loro capacità produttiva.
- Formazione e informazione. L'Ajuntament de Serra offre corsi di formazione ai lavoratori del settore del pellet e organizza eventi informativi per promuovere l'uso del pellet come combustibile.
- Promozione del turismo sostenibile. L'Ajuntament de Serra promuove il turismo sostenibile nella zona, offrendo visite guidate alle aziende produttrici di pellet e agli impianti di produzione di energia da biomassa.

Tematiche affrontate:

- Uso di biomassa.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

SUERAS

Sueras

Quattro centri abitati musulmani o aljamas sembrano essere all'origine dell'attuale Sueras. Ne esistono vestigia nei paesi di Benalises e Suera Alta, che con la conquista cristiana si concentrarono in un unico nucleo, l'attuale Suera Baja. La toponomastica del comune viene fatta coincidere con la parola araba Sukhayra in consonanza con la sua posizione difensiva su una collina e riparata dalla montagna scoscesa. Il suo status di comune confinante con La Plana ha fatto sì che i suoi abitanti si spostassero quotidianamente per lavorare nell'industria della ceramica principalmente a Onda, Vila-real e L'Alcora. L'agricoltura si traduce in un'attività part-time e quasi come semplice distrazione e rifornimento di prodotti alle famiglie. per le strade di Sueras dove troveremo luoghi eccezionali come Plaza de la Iglesia, Calle del Retor, Calle del Raval, Pelota, Mayor e Nueva. Nell'area urbana, nella Plaza Mayor si trova la Fontana e la Casa Abadía; Il Centro Culturale e Ricreativo si trova in Plaza Font Seca. Il quadro ecologico in cui si trova Suera è creato dagli spettacolari paesaggi naturali dei contrafforti della Sierra Espadàn. Il rilievo è molto aspro, evidenziando montagne come La Serra, La Atalaya, El Tosal o El Casalet. Ha un clima temperato.

Turismo esperenziale a Sueras

Nei limiti del Parco Naturale della Sierra de Espadán si trova la fantastica città di Sueras . La sua posizione era strategica in tempi remoti, quando era circondata da grandi e spettacolari boschi di lecci, pini e sughere. Questo borgo situato nella regione di Plana Baja , ha un chiaro sapore musulmano, che si percepisce nelle sue strade strette e nelle case imbiancate a calce. La Chiesa , il suo Eremo e il Castello , sono opere d'arte che possiamo godere in questa città, dove il cinguettio degli uccelli e il suono dell'acqua che scorre ci accompagnano, in mezzo a questa infinita solitudine. La pace cammina al nostro fianco, lungo il percorso che percorriamo nella bellissima cittadina di Sueras . È piccolo, motivato dal luogo in cui sono state installate le prime case, per cui la nostra passeggiata si svolge tra saliscendi. Sueras Alta , un luogo disabitato di origine musulmana che conserva ancora alcuni ruderi di case e strade, per cui è stata dichiarata "Zona di Protezione Archeologica". Allo stesso modo, le prodigiose terre di Sueras sono riuscite a portare ai giorni nostri l' Olivo di Algepsar , che si stima abbia 500 anni ed è più bello che mai. Allo stesso modo, Madre Natura ci regala l' Olivo de la Campana , un albero bicentenario con una storia molto curiosa. La campana è stata costruita con i resti di un ordigno bellico che non è esploso; Si dice che chi lo vede debba suonare il campanello, e se lo giriamo attiriamo buona fortuna.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 316 metri s.l.m.
Numero di abitanti: 572

Dettagli del progetto e obiettivi:

- La creazione di un nuovo centro di interpretazione del patrimonio storico e culturale della città.
- La realizzazione di un nuovo parco urbano con giochi e attrazioni per bambini e famiglie.
- L'organizzazione di eventi e festival culturali e gastronomici durante tutto l'anno.
- Il potenziamento della segnaletica turistica e la creazione di nuovi itinerari turistici.
- La promozione della città sui social media e sui siti web turistici.

Tematiche affrontate:

- Turismo esperenziale;
- Percorsi naturalistici;
- Accessibilità.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Teulada-Moraira

Teulada-Moraira è un comune spagnolo situato nella comunità autonoma Valenciana, nella provincia di Alicante e nella comarca di la Marina Alta. Con una popolazione di circa 12.214 abitanti, Teulada-Moraira è una località costiera insignita dalla sua posizione nella rinomata Costa Blanca, distante circa 100 chilometri da Valencia. Il comune è composto da due centri principali: Teulada, un antico paese di origine romana situato su una collina, e Moraira, una moderna località balneare situata lungo il mare. Teulada-Moraira è una rinomata meta turistica, rinomata tanto per le sue splendide spiagge quanto per il suo ricco patrimonio storico e culturale. Tra le attrazioni più celebrate di Teulada-Moraira vi sono le sue incantevoli spiagge, tra la Playa de Moraira.. Altre rinomate spiagge includono la Playa de Teulada, la Playa del Portet e la Playa del Racó de Conill. Il centro storico di Teulada è caratterizzato da strette stradine e antiche case, mentre quello di Moraira offre un ambiente più moderno con negozi, ristoranti e bar. Il castello medievale di Moraira, situato sulla punta della penisola, rappresenta un'importante testimonianza storica della regione. Il parco naturale del Montgó, situato a nord di Teulada-Moraira, offre una varietà di paesaggi che comprendono montagne, foreste e spiagge, arricchendo ulteriormente l'offerta turistica della zona.

Smart Village Teulada-Moraira

Nel 2019, Teulada-Moraira è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti;
La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Teulada-Moraira di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile; La promozione di attività ricreative e sportive per i giovani; Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Teulada-Moraira, Spagna
Distretto: Marina Alta
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 185 metri s.l.m.
Numero di abitanti: 14.778

Dettagli del progetto e obiettivi:

Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente.
Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico.
Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica.
Il comune ha promosso eventi culturali e turistici sostenibili. Questo ha contribuito a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Tematiche affrontate:

- Sostenibilità;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

TERUEL

Teruel

Teruel, situata su un'altura nel sud dell'Aragona, conserva nel centro storico un'importante eredità medievale. La torre della cattedrale e quelle di San Salvador, San Martín e San Pedro sono i gioielli di un complesso monumentale in stile mudéjar che è stato dichiarato Patrimonio dell'Umanità. Questa città, leggendaria grazie alla celebre storia degli amanti di Teruel, conserva angoli pieni di fascino, come la centrale piazza del Torico, l'acquedotto con gli archi e il celebre viale dell'Óvalo.
Da tempi remoti, nelle vicinanze dell'attuale Teruel, si stanziarono diverse civiltà preistoriche e iberiche. Tuttavia, la nascita e lo sviluppo di questa urbe raggiunse il massimo apogeo durante il Medioevo, momento in cui il perimetro della città venne cintato trovandosi, in terra cristiana, confinante con il regno musulmano di Valencia. E proprio l'influenza islamica ha lasciato a Teruel e in Aragona il più importante complesso monumentale mudéjar spagnolo, uno stile che unì il gotico con elementi architettonici musulmani.
Il profilo della città lascia emergere altre torri in stile mudéjar di grande interesse. Nella via Nueva si innalza la torre di San Salvador, con la sua facciata in mattoni, ordini di archi doppi e ricchi decori con dettagli in ceramica.

Il recupero dell'architettura tradizionale in gesso

La Fondazione Santa María de Albarracín, fondata nel 1996, rappresenta un esempio eccellente di gestione innovativa del patrimonio culturale, focalizzata sul recupero e sulla valorizzazione dell'architettura tradizionale in gesso di Albarracín. Situata nell'antico Palazzo Vescovile della città, restaurato attraverso programmi di formazione applicata, la Fondazione si impegna a promuovere la proiezione ordinata e armoniosa di Albarracín come emblema culturale di rilievo.
L'iniziativa si concentra principalmente sul gesso, un materiale distintivo nell'architettura locale, incoraggiando il recupero compatibile delle strutture tradizionali. Attraverso corsi, seminari, mostre e concerti, la Fondazione attiva un programma culturale dinamico che coinvolge residenti e visitatori. Particolarmente significativo è il sostegno alla creazione artistica e alla formazione dei restauratori di beni mobili, contribuendo così a revitalizzare Albarracín e a posizionarla come punto di riferimento culturale di prim'ordine nel panorama nazionale e internazionale.

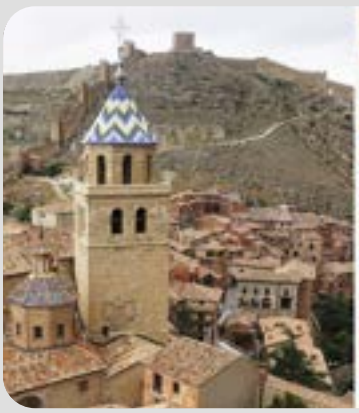
Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 915 metri s.l.m.
Numero di abitanti: 35.675

Dettagli del progetto e obiettivi:

Lo sviluppo socioculturale ed economico del territorio; Restauro, conservazione e gestione dei beni culturali; La rivitalizzazione e la proiezione del patrimonio culturale e storico; La promozione di diverse attività culturali e formative; L'istituzione di modalità di collaborazione tra entità diverse.

- Consulenza sulle tecniche di manutenzione e restauro;
- Formazione agli artigiani;
- Organizzazione di eventi e campagne di sensibilizzazione;
- Ricerca e documentazione.
- Il restauro di edifici storici in gesso;
- La creazione di nuovi spazi pubblici e culturali;
- La promozione del turismo sostenibile.



Tematiche affrontate:

- Recupero dell'architettura tradizionale in gesso;
- Strategie e percorsi di valorizzazione per riportare in auge le antiche tecniche costruttive.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

TINENÇA DE BENIFASSÀ

Il Parco Naturale Tinença de Benifassà è un'area protetta situata tra le regioni di Castellón degli Els Ports e El Baix Maestrat. Questo parco include i terreni antichi del monastero di Benifassà, che si estendono su un complesso montuoso di elevato valore ecologico. Una parte del territorio è integrata nella Riserva Nazionale di Caccia Puertos de Tortosa y Beceite. Una rete di sentieri segnalati collega i sette paesi di La Tinença: Bel, El Ballestar, Boixar, Castell de Cabres, Coratxà, Fredes e La Pobla de Benifassà, offrendo itinerari escursionistici che permettono ai visitatori di esplorare questa zona straordinariamente conservata. Nel Parco si distinguono due elementi di particolare valore storico e culturale: le pitture rupestri e il Convento Reale di Santa María de Benifassà. Le pitture rupestri sono patrimonio UNESCO. Il Convento Reale di Santa María de Benifassà, tra i primi fondati nella Comunità Valenciana, rappresenta un altro importante sito storico.Vanta alcune delle foreste meglio conservate della Comunità Valenciana, con abbondanza di pini silvestri, pini rossi e pini neri, nonché tigli e faggi. L'area ospita una fauna diversificata, con specie carismatiche come lo stambecco, il capriolo, il cinghiale, il grifone, l'aquila del Bonelli e l'aquila minore.

La Setena

La strategia smart della Tinença de Benifassà si concentra sull'integrazione sostenibile delle sue risorse naturali e culturali per promuovere lo sviluppo turistico e sociale della regione. La Tinença è rinomata per le sue lussureggianti foreste e il suo paesaggio montuoso di montagne, cime e burroni calcarei. Quest'area naturale ospita specie protette e animali selvatici come volpi, cinghiali e l'imponente capra ispanica, insieme a numerosi uccelli rapaci. Il patrimonio culturale e storico, arricchito da monumenti, tradizioni folcloristiche e un paesaggio unico, costituisce una base solida per il turismo culturale. La conservazione di questi elementi storici e naturali è fondamentale per attrarre visitatori interessati alla natura, alla cultura locale e alle attività all'aria aperta. La promozione di un'offerta turistica variegata completa l'attrattività della regione. La Tinença de Benifassà adotta anche strategie per la gestione e la valorizzazione del territorio, mirando a preservare l'integrità ecologica e paesaggistica mentre si sviluppano nuove opportunità economiche attraverso il turismo responsabile. L'accesso a sentieri escursionistici segnalati e la promozione di attività avventurose sono parte integrante di questa strategia, che mira a offrire esperienze memorabili in un ambiente naturale protetto e ben gestito.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 316 metri s.l.m.
Numero di abitanti: 227

Dettagli del progetto e obiettivi:

- Il potenziamento della segnaletica turistica e la creazione di nuovi itinerari turistici.
- La promozione dei sette villaggi sui social media e sui siti web turistici.
- La creazione di un centro di interpretazione del paesaggio naturale della zona.
- L'organizzazione di eventi e festival culturali e gastronomici durante tutto l'anno.
- Il potenziamento della rete di sentieri escursionistici e ciclabili.
- La promozione dell'educazione ambientale e della sostenibilità.

Tematiche affrontate:

- Turismo esperenziale;
- Percorsi naturalistici;
- Collegamento tra i borghi.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

TODOLELLA

Todolella

La struttura del centro storico di Todolella e le sue caratteristiche viuzze invitano a piacevoli passeggiate. Il Castello della Todolella, risalente al XIV secolo e situato su un colle che sovrasta il paese, preserva ancora il portone d'ingresso, le torri, la piazza d'armi e decorazioni interne ben conservate. L'edificio municipale, nella Plaza Mayor, si distingue per un arco ribassato che conduce a un portico. Al sud del comune si trova un complesso architettonico unico che include un ponte gotico sul fiume Cantavieja, l'eremo di San Onofre e il Puente del Molino, il primo ponte costruito sul fiume accanto al vecchio mulino.
Il primitivo villaggio abbandonato di Sarañana, a due chilometri da Todolella, offre un ambiente di silenzio e pace, con un gruppo di case e monumenti che raccontano la sua storia disabitata. I sentieri della Todolella conducono a paesaggi naturali di straordinaria bellezza, come la Mola del Roc con l'Eremo di San Cristòfol, da dove si possono ammirare panorami mozzafiato, tramonti suggestivi e cieli stellati nelle notti d'estate. Todolella è anche rinomata per le sue tradizioni tramandate di generazione in generazione, come la lavorazione artigianale delle espadrillas.

Espadrillas

La strategia smart per lo sviluppo del territorio di Els Ports si concentra sul preservare e valorizzare l'antica tradizione artigianale delle espadrillas, simbolo della cultura locale. Questo processo artigianale, che impiega tecniche completamente manuali nella lavorazione delle fibre vegetali come canapa, juta e sparto, non solo conserva le pratiche tradizionali ma promuove anche la sostenibilità ambientale. L'integrazione di moderni approcci di design e produzione, inclusi zeppe e tacchi realizzati con sparto, insieme a cotoni colorati e disegni innovativi, rappresenta un passo avanti nella diversificazione e commercializzazione del prodotto. Questa evoluzione non solo rafforza l'economia locale attraverso industrie familiari come quella di La Mata, ma apre anche nuove opportunità per il mercato regionale e oltre. Le espadrillas di Els Ports sono promosse non solo come calzature di qualità ma anche come simbolo di identità culturale. L'adozione di strategie di marketing mirate, la partecipazione a fiere e eventi nazionali e internazionali e la collaborazione con istituzioni locali e regionali sono parte integrante di questa strategia, mirata a garantire la continua valorizzazione e diffusione delle espadrillas tradizionali di Els Ports nel panorama globale della moda e del design artigianale.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 115 metri s.l.m.
Numero di abitanti: 138

Dettagli del progetto e obiettivi:

- La creazione di un museo dedicato alla storia delle espadrillas.
- L'organizzazione di eventi e festival per promuovere le espadrillas.
- La collaborazione con aziende locali per sviluppare nuovi modelli di espadrillas.
- La creazione di un marchio di qualità per le espadrillas di Todolella.

Tematiche affrontate:

- Artigianato locale;
- Cultura e Tradizione locale.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Vilafàmes

Vilafamés è un comune spagnolo di 2.222 abitanti situato nella comunità autonoma Valenciana.
Si trova nella provincia di Castellón, nella comarca del Alto Mijares.
Vilafamés è un villaggio medievale molto ben conservato, con un centro storico labirintico di stradine strette, piazze e fontane.
Il villaggio è anche circondato da montagne, che offrono splendide viste panoramiche.
Tra le attrazioni turistiche di Vilafamés ci sono:
Il castello di Vilafamés, un castello medievale costruito su una collina che domina il villaggio.
La Iglesia de Santa María la Mayor, una chiesa gotica del XIV secolo.
La Plaza Mayor, una piazza principale del villaggio con un'antica fontana.
Il Museo de Vilafamés, un museo che ospita una collezione di reperti archeologici e storici provenienti dal villaggio e dai dintorni.
Vilafamés è una destinazione turistica popolare, sia per la sua storia e cultura che per la sua bellezza naturale. Il villaggio è facilmente raggiungibile da Valencia in treno o in auto.

Smart Village Vilafàmes

Nel 2017, Vilafamés è stato selezionato come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti; La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Vilafamés di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile; La promozione di attività ricreative e sportive per i giovani;
Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Vilafamés, Spagna
Distretto: Alto Mijares
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 726 metri s.l.m.
Numero di abitanti: 1.514

Dettagli del progetto e obiettivi:

Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente. Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico. Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso.
Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica. Il comune ha promosso eventi culturali e turistici sostenibili. Questo ha contribuito a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Tematiche affrontate:

- Sviluppo sostenibile;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

VILLAJOYOSA

Villajoyosa

Villajoyosa è un comune spagnolo di 33.974 abitanti situato nella comunità autonoma Valenciana.
Si trova nella provincia di Alicante, nella comarca di la Marina Baixa.
Villajoyosa è un villaggio costiero molto pittoresco, con un centro storico colorato e vivace.
Il villaggio è anche noto per le sue spiagge, tra cui la Playa de la Vila, la Playa de la Almadraba e la Playa de la Cala de Finestrat.
Villajoyosa è una destinazione turistica popolare, sia per la sua bellezza naturale che per la sua ricca storia e cultura. Il villaggio è facilmente raggiungibile da Valencia in treno o in auto.
Ecco alcune delle attrazioni turistiche più popolari di Villajoyosa:

Il Castello di Villajoyosa: un castello medievale che domina il villaggio.
La Chiesa di San Bartolomé: una chiesa gotica del XIV secolo.
La Playa de la Vila: una spiaggia lunga e sabbiosa.
La Playa de la Almadraba: una spiaggia più piccola e tranquilla.
La Playa de la Cala de Finestrat: una spiaggia rocciosa con acque cristalline.

Smart Village Villajoyosa

Nel 2019, Villajoyosa è stata selezionata come uno dei 100 villaggi intelligenti d'Europa nell'ambito del progetto "Smart Cities and Communities" finanziato dalla Commissione Europea. Il progetto ha permesso al comune di implementare una serie di progetti per migliorare la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di una rete wi-fi gratuita in tutto il villaggio; L'installazione di sensori e telecamere per monitorare il traffico e la qualità dell'aria; Lo sviluppo di un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni; L'implementazione di un sistema di raccolta differenziata dei rifiuti; La promozione di eventi culturali e turistici sostenibili.
Il progetto "Smart Cities and Communities" ha permesso a Villajoyosa di diventare un villaggio più moderno, sostenibile e innovativo. Il comune sta già lavorando a una serie di progetti futuri per migliorare ulteriormente la qualità della vita dei residenti e dei visitatori, come ad esempio: La creazione di un centro di innovazione per promuovere l'imprenditorialità e lo sviluppo di nuove tecnologie; L'implementazione di un sistema di trasporto pubblico sostenibile; La promozione di attività ricreative e sportive per i giovani; Il miglioramento dei servizi sociali per le persone anziane e disabili.

Dati geografici:

Località: Villajoyosa, Spagna
Distretto: Marina Baixa
Regione: Comunità Valenciana
Lingua: Spagnolo
Orario: UTC+01:00
Altitudine: 30 metri s.l.m.
Numero di abitanti: 34.828

Dettagli del progetto e obiettivi:

Ecco alcuni esempi specifici delle strategie smart e innovative che Villajoyosa ha attuato per migliorare le sue condizioni e diventare un villaggio intelligente: Il comune ha creato una rete wi-fi gratuita in tutto il villaggio, che permette ai residenti e ai visitatori di connettersi a Internet gratuitamente. Il comune ha installato sensori e telecamere per monitorare il traffico e la qualità dell'aria. Questo ha permesso al comune di migliorare la gestione del traffico e di ridurre l'inquinamento atmosferico. Il comune ha sviluppato un'app per smartphone che permette ai visitatori di esplorare il villaggio e conoscere le sue attrazioni. L'app fornisce informazioni sulle attrazioni turistiche, sui servizi pubblici e sugli eventi in corso. Il comune ha implementato un sistema di raccolta differenziata dei rifiuti. Questo ha permesso al comune di ridurre la quantità di rifiuti che vengono inviati in discarica.
Il comune ha promosso eventi culturali e turistici sostenibili. Questo ha contribuito a migliorare la qualità della vita dei residenti e dei visitatori e a ridurre l'impatto ambientale del turismo.

Tematiche affrontate:

- Sostenibilità;
- Innovazione;
- Cultura.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

Villahermosa del Rio

Villahermosa del Río è immersa in un impressionante paesaggio montano. Con vette che superano i 1.500 m sul livello del mare, le montagne rappresentano una sfida spettacolare per escursionisti ed escursionisti appassionati. Vicino al villaggio, puoi scalare le pendici di El Penyagolosa , Sierra de la Batalla, Torre Alta, Marcén e Peñagolosilla.
Una delle passeggiate più popolari di Villahermosa del Río ti porterà alla cascata del fiume Carbó . Questo facile sentiero permette di immergersi in un paesaggio frondoso che culmina alla cascata dove le acque color smeraldo cadono in una pozza ghiacciata.
Villahermosa del Río ospita anche una bellissima cappella che si trova a circa 5 km dal villaggio. Ermita de San Bartolomé è un grazioso edificio in pietra immerso nella natura selvaggia e merita una visita.
Il prossimo nella tua lista di cose da vedere a Villahermosa del Río è la collezione parrocchiale di arte sacra , che risale al XIV secolo. Inoltre, non vorrai perderti il castello che ha ancora una parte della sua cortina in piedi. E poi ci sono i dipinti gotici e rinascimentali della chiesa La Natividad.

La vuelta de la Hoz

La strategia smart per lo sviluppo di questa città si concentra sulla valorizzazione del ricco patrimonio storico e naturale, promuovendo la sostenibilità ambientale e il turismo responsabile. Situata su una collina, la città è caratterizzata da case bianche dai tetti rossi e stradine tortuose che conducono a angoli magici. I fiumi Carbo e Villahermosa, con le loro cascate e sorgenti, creano un ambiente ideale per l'esplorazione di boschi di querce e pini.
Nonostante le distruzioni della guerra di successione spagnola, la città ha conservato parte del suo immenso patrimonio. La Chiesa Parrocchiale di Nuestra Señora de la Natividad, con la recente collocazione dell'immagine della Vergine dell'Immacolata nel 2019, e lo scenografico Campanile rappresentano punti focali nella storia della città.
L'Eremo del Calvario, tra i fiumi Villahermosa e Carbo, e i resti del castello mudéjar di La Muela evidenziano l'antica grandezza della regione. La strategia smart include iniziative sostenibili per preservare l'ambiente naturale e migliorare l'accessibilità ai siti storici. Programmi di educazione ambientale, itinerari turistici sostenibili e l'uso di tecnologie digitali per gestire e promuovere il patrimonio culturale sono parte integrante di questo approccio, garantendo uno sviluppo armonioso e responsabile della città e delle sue risorse.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 755 metri s.l.m.
Numero di abitanti: 442

Dettagli del progetto e obiettivi:

- L'installazione di una rete di sensori per monitorare il traffico, la qualità dell'aria e il consumo energetico.
- La realizzazione di un sistema di mobilità sostenibile, con l'utilizzo di autobus elettrici e biciclette.
- L'implementazione di un sistema di e-government, per consentire ai cittadini di interagire con le autorità comunali online.
- La promozione di eventi e attività culturali e sociali, per coinvolgere i cittadini e creare una comunità più partecipativa.

Tematiche affrontate:

- Turismo rurale;
- Sentieri naturalistici.

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

XÀTIVA

Xativa

È il capoluogo della zona de La Costera. Dichiarata Complesso Storico Artistico, il cranio Neanderthal rinvenuto nella Cova Negra risale a 30.000 anni a.C. Città natale del pittore José Ribera, lo Spagnoletto, e del papa Alessandro VI Borgia, la sua leggenda nera è legata al re Felipe V che, dopo aver vinto la battaglia di Almansa nella Guerra de Successione, ordinò che venisse incendiata cambiandole poi il nome con quello di San Felipe. A ricordo dell'onta subita il ritratto del monarca è appeso a testa in giù nel museo locale dell'Almodí. La città conserva un ricco patrimonio artistico che si va scoprendo durante la visita: la chiesa collegiata rinascimentale, l'eremo di San Felice, il più antico della città (assicurano che fosse un tempio mozarabico ricostruito da Jaime I); la chiesa di San Pietro, dove fu battezzato Alessandro VI, l'Ospedale Reale, che conserva intatta la facciata originale in stile rinascimentale, i palazzi del Marchese di Montortal e di Alarcó. E le fontane: quella barocca di San Francesco, quella gotica della Trinità, e quella delle 25 cannelle neoclassica. Con 30 torri e quattro porte fortificate spicca al di sopra di tutto l'enorme castello, risultato della fusione di una fortezza ibero-romana con una araba. Da qui digradano le mura che fino al sec. X cingevano la città romana. Più tardi fu aggiunta una seconda muraglia che circondava quello che attualmente è il centro storico.

Castello di Xativa

L'entroterra Valenciano offre diversi punti d'interesse per un'escursione insolita durante il vostro viaggio, e Xativa è uno di questi. Primo per la città in sè che è tipicamente spagnola e poco turistica, e secondo per la sua maestosa fortezza. Il castello è in realtà composto di due fortezze, la prima "Castell Menor", di origine iberica e la seconda "Castell Major", aggiunta in seguito alla conquista dei romani.
Si colloca nell'antica "Via Augusta" che collegava Roma con Cadiz e Cartagena, attraverso i Pirenei.
Questa fortificazione ha le sue origini in una costruzione iberica che ubicata in una delle parti più alte della montagna (Castello Minore). I romani, successivamente, conquistandola, unirono, nel secondo punto elevato, un'altra fortezza che comunicava con la precedente (Castello Maggiore). Entrambi furono modificate dagli arabi, che allargarono le mura fino a farle concedere con quelle attuali. Successivamente, con maggiori o minori modifiche, le mura e il castello affrontarono la conquista di Jaime I, la ribellione della Germania e la Guerra di Successione, ma la base del complesso architettonico è rimasta invariata.

Dati geografici:

Località: Valencia
Distretto: Castellón
Regione: Spagna
Lingua: Spagnolo - Valenciano
Orario: UTC/GMT +1 ora
Altitudine: 115 metri s.l.m.
Numero di abitanti: 29.386

Dettagli del progetto e obiettivi:

Miglioramento dell'efficienza energetica. Il comune investirà in tecnologie per migliorare l'efficienza energetica dei edifici pubblici e privati. Questo includerà l'installazione di pannelli solari, l'illuminazione a LED e la gestione intelligente dei rifiuti.
Sviluppo di un sistema di mobilità sostenibile. Il comune investirà in trasporti pubblici sostenibili, come autobus elettrici e biciclette. Inoltre, creerà una rete di percorsi ciclabili e pedonali per rendere più facile spostarsi in città senza usare un'auto.
Miglioramento dei servizi pubblici. Il comune investirà in tecnologie per migliorare i servizi pubblici, come l'illuminazione stradale, la raccolta dei rifiuti e la manutenzione delle strade. Questo includerà l'installazione di sensori per monitorare il traffico e la qualità dell'aria.
Sviluppo di una comunità più partecipativa. Il comune investirà in tecnologie per coinvolgere i cittadini nel processo decisionale. Questo includerà la creazione di un sito web per il governo partecipativo e l'uso di social media per condividere informazioni e chiedere feedback.

Tematiche affrontate:

- Turismo culturale;
- Turismo rurale;
- Storia, arte e tradizione;

* Visit Valencia. (n.d.). Pueblos bonitos de Valencia. Visit Valencia. Recuperato da https://www.visitvalencia.com/que-hacer-valencia/naturaleza-en-valencia/pueblos-bonitos-valencia

SOMMARIO ANALISI SMART VILLAGES EUROPEI

Elenco dei villaggi europei analizzati e delle tematiche maggiormente trattate

SMART VILLAGES VALENCIANI			
	Localizzazione	**Smart Village**	**Tematica**
1	Castellon	*Morella*	Integrazione sociale, verde urbano, aerotermia
2	Castellon	*San Mateo*	Cohousing, turismo rurale, complessi turistici
3	Valencia	*Xativa*	Turismo culturale e rurale, storia, arte e tradizione
4	Castellon	*Jerika*	Turismo rurale, sentieri naturalistici
5	Castellon	*Todolella*	Artigianato locale
6	Castellon	*Villahermosa del Rio*	Turismo rurale, sentieri naturalistici
7	Castellon	*Sueras*	Turismo esperenziale, sentieri naturalistici
8	Castellon	*Segorbe*	Tradizioni popolari
9	Castellon	*Tinença di Benifassà*	Turismo esperenziale, percorsi naturalistici e collegamento tra i borghi
10	Valencia	*Bocairent*	Mobilità sostenibile, economia locale, qualità della vita, digitalizzazione e sostenibilità ambientale
11	Valencia	*Guadalest*	Turismo, sostenibilità, innovazione e cultura
12	Castellon	*Chelva*	Turismo sostenibile, mobilità sostenibile, innovazione e cultura
13	Valencia	*Vilafàmes*	Sviluppo sostenibile, innovazione e cultura
14	Alicante	*Biar*	
15	Castellon	*Ares del Mestrat*	
16	Alicante	*Altea*	
17	Alicante	*Villajoyosa*	
18	Alicante	*Sax*	
19	Alicante	*Teulada - Morarira*	
20	Castellon	*Culla*	
21	Valencia	*Sagunto*	Sviluppo sostenibile, innovazione, cultura, storia e tradizione
22	Valencia	*Nueva Tabarca*	Sviluppo sostenibile, innovazione e cultura
23	Valencia	*Chulilla*	Sostenibilità, innovazione e sicurezza
24	Alicante	*Dènia*	Sostenibilità, energia, qualità della vita e turismo
25	Castellon	*Chodos*	Sostenibilità, innovazione e vivibilità
26	Castellon	*Montainejos*	Energia sostenibile, uso di fonti rinnovabili, innovazione, tecnologia e digitale
27	Castellon	*Teruel*	Recupero dell'architettura tradizionale in gesso
28	Valencia	*Serra*	Uso di biomassa
29	Alicante	*Calpe*	Recupero dell'architettura tradizionale
30	Castellon	*Peniscola*	
31	Castellon	*Rincon de Ademuz*	
32	Castellon	*Benicarlò*	

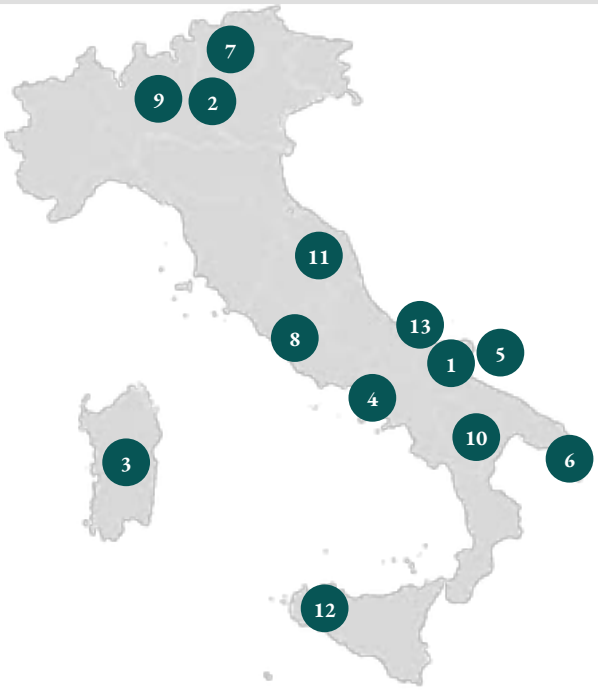
Statistica delle tematiche maggiormente trattate

L'analisi dei 32 villaggi dell'ambito valenciano rivela sette tematiche di rilevanza strategica: sostenibilità ambientale, tradizioni dei piccoli insediamenti, turismo, accessibilità, recupero del patrimonio edilizio, digitalizzazione e accoglienza dei migranti. Questi villaggi si collocano in contesti socioeconomici misti, caratterizzati da situazioni più o meno fragili, ma anche medio-ricche, dove il turismo ha acquisito un ruolo predominante, dando origine a fenomeni di touristification.

In questo quadro, le strategie di sostenibilità ambientale emergono come prioritarie, comprendendo iniziative di greening e promozione della sostenibilità in tutti i settori. A partire da tali principi, le altre categorie si sviluppano successivamente, facilitando una gestione più efficiente delle risorse interne e una migliore organizzazione del contesto territoriale.

Le tradizioni locali e il turismo, in particolare, si configurano come i processi iniziali di maggiore rilevanza. Non solo favoriscono l'apertura verso il mondo esterno, ma giocano un ruolo cruciale nella diffusione e valorizzazione della cultura locale. Questo approccio integrato non solo sostiene le economie locali, ma contribuisce anche a preservare l'identità culturale dei villaggi, promuovendo opportunità di crescita sostenibile e inclusiva. Tali dinamiche pongono in evidenza l'importanza di un piano strategico coeso che favorisca l'interazione tra sviluppo economico e conservazione del patrimonio culturale e ambientale.

Smart Villages Italiani



20. Santa Fiora
[TOSCANA]

21. Sestri Levante
[LIGURIA]

10. Craco
[BASILICATA]

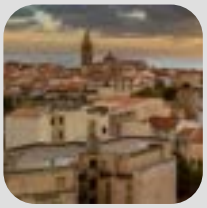
9. Concorezzo
[LOMBARDIA]

8. Civita di Bagnoregio
[LAZIO]

15. Laurenzana
[BASILICATA]

1. Alberobello
[PUGLIA]

5. Bari
[PUGLIA]



3. Alghero
[SARDEGNA]

16. Nurghedu S. Vittoria
[SARDEGNA]

12. Erice
[SICILIANA]

6. Botrugno
[PUGLIA]

23. Terre Alte
[FRIULI VENEZIA GIULIA]

13. Gargano
[PUGLIA]

18. Pinerolo
[PIEMONTE]

24. Val Bormida
[LIGURIA]

25. Val di Susa
[PIEMONTE]

7. Cevo
[LOMBARDIA]

26. Veneto

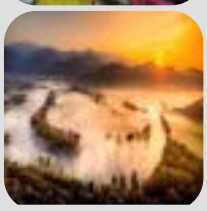
11. Dozza
[EMILIA - ROMAGNA]

14. Gibellina
[SICILIA]

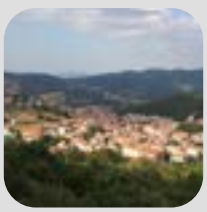
4. Apice
[CAMPANIA]

19. RURAL FVG
[FRIULI VENEZIA GIULIA]

22. Tassignano
[TOSCANA]



2. Airuno
[LOMBARDIA]



17. Ollolai
[SARDEGNA]

ALBEROBELLO - PUGLIA

Alberobello

Il comune di Alberobello, celebre per i suoi trulli, magnifiche abitazioni tradizionali pugliesi: paese riconosciuto come patrimonio dell'umanità dell'UNESCO. Le case tradizionali di pietra bianca che illumina il paesaggio si distinguono l'una dalle altre dai tetti a cupola ciascuno adornato da un pinnacolo diverso. Il maggior numero di trulli è concentrato nel centro storico che comprende il rione Aia Piccola, la cui struttura tipicamente medievale si compone in una rete intricata di stretti vicoli e vie, e il rione Monti, celebre per il complesso di trulli che si arrampicano sulla verde collina. L'architettura narra la storia dell'abitato quando il conte di Conversano Gian Girolamo II Acquaviva d'Aragona, desideroso di costruire un feudo indipendente dalla corte di Napoli, impose la costruzione delle prime abitazioni con la sola pietra a secco, senza malta. Edificare queste strutture abitative precarie serviva a sfuggire al pagamento dei tributi del re per ogni nuova costruzione. Quelle che dovevano essere strutture fragili pronte a essere smantellate in caso di ispezioni governative furono sapientemente progettate ed erette dai contadini sfruttando la forma conica che, pur semplice e modesta, creava al suo interno gli spazi vivibili che ancora oggi è possibile visitare e che fanno di Alberobello una delle più apprezzate mete turistiche della zona.

Smart Village Alberobello

Sostenere il recupero e la riqualificazione nelle aree rurali delle architetture minori di Puglia: è l'obiettivo del bando, pubblicato sul Bollettino Ufficiale della Regione Puglia n. 89 dell'11 agosto 2022, a valere sulla sottomisura 7.6 del Programma di Sviluppo Rurale 2014-2022. Trulli, lamie, casedde, pagliare, in pietra o in tufo, realizzate a secco e non solo, rappresentano gli insediamenti edilizi tipici del paesaggio agricolo pugliese.
Il bando della Sottomisura 7.6 del PSR Puglia, per il quale c'è stata piena condivisione con il partenariato, prevede l'erogazione di un sostegno, in termini di contributo in conto capitale, commisurato ai costi sostenuti e regolarmente approvati, pari al 50% della spesa ammessa a finanziamento e relativa a interventi di manutenzione straordinaria, restauro e risanamento conservativo e ristrutturazione edilizia. Il limite minimo dell'investimento richiesto, comprensivo delle spese generali, non deve essere inferiore a 20 mila euro, mentre il limite massimo è di 60 mila euro. Possono accedere al bando i proprietari privati dei manufatti che ricadono in zona agricola.

Dati geografici:

Località: Alberobello
Stato: Italia
Regione: Puglia
Lingua: Italiana
Orario: Roma (CET)
Altitudine: 406 m s.l.m.
Numero di abitanti: 10.159

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1

L'obiettivo del bando, pubblicato sul Bollettino Ufficiale della Regione Puglia n. 89 dell'11 agosto 2022, è sostenere il recupero e la riqualificazione delle architetture minori nelle aree rurali della Puglia, con particolare riferimento ad Alberobello. Questo iniziativa rientra nella sottomisura 7.6 del Programma di Sviluppo Rurale 2014-2022. I trulli, caratteristici edifici conici in pietra, sono un elemento distintivo del paesaggio di Alberobello e rappresentano un patrimonio storico e culturale di grande valore.
Questo progetto non solo promuove la conservazione del patrimonio architettonico di Alberobello, ma contribuisce anche alla crescita economica e turistica della regione, migliorando l'attrattività del territorio e offrendo nuove opportunità di sviluppo sostenibile attraverso il recupero delle architetture tradizionali.

Tematiche affrontate:

- Commercio;
- Sviluppo del territorio;
- Recupero dell'Architettura rurale;
- Turismo.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Liberi Sogni Cooperativa sociale

Cooperativa sociale del lecchese che gestisce e promuove progetti e servizi educativi, culturali e sociali tra cui la Libera Università del Bosco, il Museo di Comunità e il Crazy-bosco. La cooperativa sociale Liberi Sogni ONLUS, nata nel settembre 2006, promuove progetti socio-educativi, culturali e ambientali nelle province di Lecco, Monza-brianza e Bergamo tesi a favorire la crescita delle nuove generazioni, il loro immaginario e il loro legame con il territorio. Ogni giorno, insieme a comuni, scuole, associazioni e famiglie, la cooperativa cerca di coltivare il futuro delle nuove generazioni, convinta che il sogno sia il più potente e irriducibile motore di cambiamento e di crescita. Tre le principali aree di intervento: settore ambiente, con il progetto "crazylienza. Tornare alla natura per coltivare il futuro" che si propone di recuperare e valorizzare un bosco abbandonato da decenni sul monte di brianza; settore cultura e animazione sociale, con le attivitá nel parco ludico di Galbiate, e attraverso la gestione dei servizi didattici e culturali del Museo Civico della Seta ABEGG di Garlate; la cooperativa sta sviluppando "verso scuola di futuro": un network di soggetti capace di dar vita ad un catalogo aperto, condiviso, generativo, in continuo divenire, per tutti i gusti, da costruire ed imparare insieme di corsi, pratiche e laboratori resilienti.

Cascina Rapello: una cascina per tutti/e

Cascina Rapello è ad Aizurro, frazione di Airuno (LC) sul Monte di Brianza, una la settecentesca Cascina Rapello, incastonata tra terrazzamenti e boschi di castagno. Oltre alla cascina di 250 mq completamente da ristrutturare che ospiterà aule formative, un laboratorio cucina di trasformazione, una sala polivalente e una piccola foresteria, ci sono 9 ettari di terra tutt'intorno, tra boschi di castagni e seminativo. Una Yurta di 50 mq in materiali naturali, tipica struttura di origine siberiana, un compost toilette per i nostri bisogni e un capanno per gli attrezzi. Dal mese di aprile 2021 la creazione del primo orto in cui tutti/e possono mettere le mani.
Un luogo in cui tornare alla Terra e dove troveranno dimora tanti progetti sociali, culturali e ambientali per grandi e piccini.
occasioni di incontro, di convivialità, di formazione, di gioco, di relazione in cui ciascuno si possa sentire accolto nella sua specificità e unicità.
Riscoperta della manualità, della cooperazione e della cura di ciò che ci circonda (umano e naturale), che un altro mondo è possibile. Approccio all'agroecologia.

Dati geografici:

Località: Aizurro (Airuno)
Stato: Italia
Regione: Lombardia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 220 m s.l.m.
Numero di abitanti: 185

Dettagli del progetto e obiettivi:

Area: Lombardia
Periodo del progetto: 2006 - oggi
Obiettivi:

- Ristrutturazione e riqualificazione della Cascina Rapello.
- Valorizzazione dei terreni circostanti.
- Sostenibilità e approccio agroecologico.
- Promozione di occasioni di incontro e formazione.
- Recupero delle tradizioni manuali, cooperazione e cura dell'ambiente.

Tematiche affrontate:

- Animazione sociale;
- Cooperative di comunità.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

ALGHERO - SARDEGNA

Alghero

Riconosciuta come la piccola Barcellona, il borgo marinaro di Alghero è il capoluogo della Riviera del Corallo. Una delle sue caratteristiche è il suo paesaggio. Fuori del centro storico e del resto dei quartieri urbani, la grande area del comune vanta diverse spiagge, baie e parchi naturali sul litorale. Il promontorio di Capo Caccia e il suo faro costituiscono una delle icone della città. Conosciuta come la piccola Barcellona italiana, il borgo marinaro di Alghero preserva l'uso del catalano, di cui è un'isola linguistica.
E' definita il capoluogo della Riviera del Corallo, nome derivante dalla preziosa quantità di corallo rosso presente nelle sue acque e pescato dai corallari subacquei. Riconosciuto come simbolo della cittadina, un ramo di corallo è infatti inserito nello stemma comunale. La Grotta Verde, grotta sommersa sul promontorio di Capo Caccia, è stata oggetto di frequentazione a partire dal neolitico antico (VI-V millennio a.C.). Sono inoltre presenti diversi villaggi, per la maggior parte collegati ai nuraghi, dove sono state rinvenute ceramiche protocorinzie e fenicie, a testimonianza dei rapporti commerciali intrattenuti con le altre regioni mediterranee.

Smart Village Alghero

Promosso dagli ex ministri responsabili del Ministero dello Sviluppo economico (Mise), del Ministero dell'Università e della ricerca (Mur) e del Ministro per l'Innovazione tecnologica e la digitalizzazione. Alghero è stata selezionata come uno dei "Borghi del futuro" grazie al progetto "Smarter Italy", che mira a integrare innovazione e tradizione nei servizi di mobilità, ambiente, benessere dei cittadini e cultura. Con circa 44.000 abitanti, Alghero rappresenta un contesto ideale per sperimentare tecnologie avanzate. Il programma prevede interventi nella Smart Mobility, per ottimizzare i trasporti e promuovere una mobilità sostenibile. La valorizzazione del patrimonio culturale è fondamentale, con il centro storico ricco di torri medievali e bastioni sul mare, che può essere ulteriormente esaltato per stimolare il turismo e l'economia locale. Il benessere dei cittadini sarà migliorato attraverso iniziative che promuovono stili di vita sani, mentre la protezione dell'ambiente è cruciale per preservare l'ecosistema della Riviera del Corallo. Con un budget di 90 milioni di euro per sviluppare soluzioni innovative, Alghero può attivare collaborazioni con aziende per rispondere alle esigenze del territorio.

Dati geografici:

Località: Alghero
Stato: Italia
Regione: Sardegna
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 7 metri s.l.m.
Numero di abitanti: 42.143

Dettagli del progetto e obiettivi:

Importo del progetto: € 90.000.000
Numero di villaggi coinvolti: 1;
Periodo del progetto: 2021 - oggi;

L'obiettivo primario del progetto è migliorare la qualità della vita delle comunità e dei cittadini mediante l'introduzione e la sperimentazione di soluzioni tecnologiche avanzate in vari settori chiave: mobilità, ambiente, benessere individuale e patrimonio culturale, più di tutti, il settore turistico.
I "Borghi del Futuro" agiscono come laboratori di sperimentazione per le tecnologie emergenti applicate ai servizi cittadini. L'approccio si basa su un sistema di "appalti innovativi", che differisce dagli appalti tradizionali nel senso che non si limita all'acquisto di prodotti o servizi standard già esistenti sul mercato. Al contrario, stimola operatori e imprese a sviluppare soluzioni innovative basate su tecnologie emergenti, rispondendo direttamente ai bisogni di servizi espressi dalle realtà territoriali coinvolte.

Tematiche affrontate:

- Smart Mobility;
- Valorizzazione dei beni culturali e tecnologie avanzate;
- Benessere sociale;
- Protezione dell'ambiente;
- Innovazione e tecnologia;
- Sviluppo economico sostenibile.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Apice

Un borgo fantasma sospeso nel tempo, definito la "Pompei del '900". Ma con la città sepolta dall'eruzione del Vesuvio del '79 d.C., questo paese sannita ha in comune l'essere considerato a tutti gli effetti un "sito archeologico" dove le lancette dell'orologio si sono fermate, regalandoci una istantanea di un tempo che fu. E mentre a Pompei si ha la possibilità di assaporare usi e consuetudini di 2000 anni fa, ad Apice gli usi e le consuetudini appartengono al secolo scorso, ma non per questo offrono sensazioni ed emozioni meno intense.
Due terremoti, due scosse, una nell'agosto del 1962, l'altra nel novembre del 1980 segnarono irrimediabilmente la storia di questo borgo.
La prima aprì una crepa profonda, tanti decisero di abbandonare le loro case, di lasciare il borgo antico, che il Ministero dei Lavori Pubblici decretò a rischio crolli e da evacuare. I cittadini lasciarono a malincuore le loro abitazioni, attratti anche dalla possibilità di costruire una nuova abitazione più grande e più accogliente. La scossa del 1980 di fatto decretò l'abbandono totale di quasi tutte le case.

Apice Vecchia - Museo a Cielo aperto

Apice Vecchia, denominata la città fantasma, la Pompei del '900, cosi come Pompei un evento naturale ha fermato il tempo ad Apice. Le insegne dei negozi, l'illuminazione pubblica, le strade ciottolate, le chiese, la scuola. Tutto è immobile, fisso. Le porte sono aperte e dentro le sale c'è un lungo silenzio. C'è nell'aria l'atmosfera dei templi profanati. Le porte sono aperte, i segreti svelati. Le stanze sono piene di oggetti, negli scaffali i libri sono al loro posto, gialli e stanchi da volersi sedere, raccogliere i dettagli e ricostruire le vite di chi ha abitato in quelle stanze. Visitare le case abbandonate diventa presto un rito, una sorta di pellegrinaggio fra le cappelle della memoria. Sedendoti sui gradini della chiesa principale del paese, l'abbazia di S. Maria Assunta, il fiume scorre in basso e la città nuova è ora visibile su una collina non troppo lontana. Simbolo ed imponente, il Castello dell'Ettore, lungo il percorso domina la valle. Un luogo ricco di fascino, ma visitarlo significa anche rispettarlo. Ogni casa custodisce una storia che tutti possono leggere e interpretare alla propria maniera, offrono un fascino suggestivo, un continuo paragone con il proprio vissuto personale. Apice Vecchia è un "borgo fantasma da vivere", con il rispetto dovuto ad un museo a cielo aperto, , che ha bisogno di cure, ma anche del calore umano per continuare a raccontare la propria storia.

Dati geografici:

Località: Apice, Benevento
Stato: Italia
Regione: Campania
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 225 m s.l.m.
Numero di abitanti: 5.310

Dettagli del progetto e obiettivi:

Area: Benevento
Periodo del progetto: 1970 - oggi
Obiettivi:

- Conservazione del patrimonio storico.
- Promozione del turismo culturale.
- Educazione e sensibilizzazione.
- Rispetto e valorizzazione.
- Coinvolgimento della comunità.
- Sviluppo sostenibile.
- Ricerca e documentazione.

Tematiche affrontate:

- Museo a cielo aperto;
- Borgo fantasma;
- Fruzione e valorizzazione;
- Accessibilità.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

BARI - PUGLIA

Bari

Condividere casa e quotidianità: a Bari parte il primo progetto di co-housing rivolto a over 65, uomini e donne, autosufficienti. Si tratta, è stato evidenziato questa mattina in conferenza stampa a Palazzo di Città, di una delle prime esperienze simili in tutta la regione. Il progetto sperimentale "Condiviviamo", promosso dall'assessorato comunale al Welfare ad esito dell'avviso pubblico "Vivere Insieme: co-housing per la terza età" e gestito dalla cooperativa sociale Occupazione e Solidarietà, è accompagnato da un video promozionale (che mira a raccogliere segnalazioni di persone interessate), firmato dal regista Alessandro Piva. Il dipartimento di Ricerca e Innovazione umanistica dell'Università di Bari, nella persona della responsabile scientifica Letizia Carrera (docente di Sociologia e ricerca sociale e Sociologia urbana), ha condotto nel frattempo un'indagine conoscitiva attraverso questionari e focus con anziani e loro familiari, presidenti di Municipi, assessori e consiglieri, assistenti sociali ed educatori, referenti associazioni e centri diurni, parroci e dirigenti scolastici (di istituti che organizzano attività formative per e con gli anziani), trattando i dati raccolti con software statistici e di analisi semantica per supportare al meglio il piano di comunicazione e la campagna di promozione del progetto e, soprattutto, per valutare la fattibilità del processo di co-abitazione fra gli anziani.

Progetto Condividiamo

Nella città di Bari ad oggi, un' esperienza che si rivolge a uomini e donne autosufficienti over 65, senza escludere la possibilità di convivenza tra persone con età differente, ad esempio anziani soli con studenti fuorisede alla ricerca di un'abitazione a Bari per studiare. La campagna di sensibilizzazione e informazione, curata dall'agenzia di comunicazione Etabeta, è stata pensata per mettere gli anziani nelle condizioni di creare o potenziare nuove relazioni interpersonali grazie alle quali pianificare quotidianamente la propria giornata in base a piccole cose, importanti perché condivise, e per incentivare l'attivazione in processi decisionali e pratici incrementando la cura personale in termini di salute fisica e psicologica. L'auspicio è quello di arrivare alla costruzione di un nuovo sapere sociale attraverso campagne formative, informative e di sensibilizzazione di cui lo spot presentato oggi vuol essere il fiore all'occhiello. Attraverso il portale di progetto www.condiviviamo.it sarà creata la banca dati di tutti coloro che chiedono di fare esperienza di co-housing: ogni aspirante co-houser potrà indicare le proprie preferenze territoriali, l'eventuale disponibilità di una casa, la richiesta di servizi specifici. All'interno del portale, inoltre, è stato attivato uno spazio dedicato a tutti i proprietari che offrono la propria casa in affitto per l'esperienza di co-housing.

Dati geografici:

Località: Bari
Stato: Italia
Regione: Puglia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 842 m s.l.m.
Numero di abitanti: 315.470

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 città;
Periodo del progetto: 2022
Obiettivi:

- Promozione delle relazioni interpersonali.
- Incremento della cura personale
- Educazione e formazione.
- Creazione di una comunità virtuale.
- Facilitazione del processo decisionale.

Tematiche affrontate:

- Co-housing;
- Valorizzazione delle risorse locali;
- Recupero e valorizzazione del patrimonio architettonico;
- Comunità.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Botrugno

Botrugno è situata su un altopiano tra le serre di Supersano e quelle di Poggiardo. Dista 32 km da Lecce e confina con i Comuni di San Cassiano, Sanarica, Scorrano, Supersano. Acquistò l'autonomia comunale nel 1958. Il suo nome potrebbe derivare dal verbo greco botruomai che significa 'produrre uva', nell'antichità, l'area su cui sorse il paese era occupata da enormi vigneti. Fondato forse dai Greci o, secondo altri, sorto a seguito della distruzione di Muro, avvenuta all'inizio del XII secolo ad opera di Guglielmo il Malo, dal normanno Tancredi fu dato in feudo a Lancellotto Capece; passò quindi ai Maremonte, ai Castriota Scanderberg, ed infine ai Guarino. Il palazzo marchesale, costruito nel 1500 per volontà dei Castriota, a pianta rettangolare, si fa ammirare per una maestosa balconata che ne occupa quasi interamente la facciata. Domina dalla parte più alta l'intero agglomerato urbano. Nelle vicinanze, la Chiesa della Madonna di Costantinopoli, conosciuta come Chiesa di S. Antonio, in stile barocco, dove si possono ammirare un'immagine bizantineggiante della Vergine col Bambino (XV sec.), una tomba rinascimentale del 1564 e pregevoli altari barocchi. Alla periferia del paese sorge la Cappella dell'Assunta. Il terreno è caratterizzato dal fenomeno del carsismo. L'economia è prevalentemente agricola e si basa sulla produzione di olive, frumento, ortaggi e tabacco.

La scatola di latta

La Scatola di Latta è un progetto nato nel 2010 nel cuore del Salento, specificamente a Botrugno, un piccolo paese caratterizzato dalla perdita significativa di popolazione negli ultimi anni. Fondato dopo gli studi in sviluppo del territorio, il progetto si propone come punto di incontro tra persone, luoghi e storie, mirando a coltivare conoscenza e intrecciare relazioni.
Tra le attività principali della Scatola di Latta ci sono le passeggiate CiviCulturali, che hanno coinvolto circa 300 camminate in quasi tutti i 96 paesi della provincia di Lecce. Queste passeggiate offrono un modo alternativo di vivere il territorio, attraverso iniziative comunitarie e conviviali senza un programma o tempi definiti. L'approccio è giocoso e invita a sperimentare il senso di spaesamento e di erranza, incoraggiando i partecipanti a "essere felici di avere in tasca soltanto le mani" mentre esplorano le bellezze nascoste della vita quotidiana nei piccoli paesi salentini. Le passeggiate sono concepite per e con i residenti locali, durante le quali si condividono storie di viaggio e di permanenza, si declamano versi e si favorisce un dialogo aperto e non giudicante. L'esperienza è caratterizzata dalla lentezza, dallo stupore e dall'ascolto attento, spesso svolgendosi di sera o nei giorni infrasettimanali, quando i paesi si presentano in un'atmosfera più tranquilla e intima.

Dati geografici:

Località: Botrugno
Stato: Italia
Regione: Puglia
Lingua: Italiano, pugliese
Orario: Roma (CER)
Altitudine: 92 m s.l.m.
Numero di abitanti: 2.622

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 città;
Periodo del progetto: 2023
Obiettivi:

- Promuovere la conoscenza del territorio.
- Creare connessioni comunitarie.
- Riscoprire la bellezza della quotidianità.
- Valorizzare il patrimonio culturale e naturale.
- Favorire lo sviluppo sostenibile.
- Generare consapevolezza e apprezzamento.
- Catalizzare nuove iniziative.

Tematiche affrontate:

- Conoscenza del territorio;
- Fruizione e valorizzazione;
- Narrazioni, tradizioni e comunità.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

CEVO - LOMBARDIA

Cevo

La Val di Bormida, incastonata tra l'Appennino Ligure e la pianura del Tanaro nel sud-est del Piemonte, è una regione dai paesaggi diversificati e affascinanti. Attraversata dal fiume Bormida di Millesimo, che le conferisce il nome, questa valle è rinomata per la sua natura incontaminata, le colline verdi e boschive, i vigneti terrazzati, i frutteti rigogliosi e gli uliveti, che caratterizzano il suo panorama. Geograficamente, la Val di Bormida fa parte del Parco naturale regionale del Marguareis, un'area protetta che abbraccia una vasta biodiversità vegetale e faunistica. Questo ambiente naturale ricco è un punto di attrazione per gli amanti della natura, che qui possono praticare escursioni, passeggiate a cavallo, trekking e mountain bike lungo una rete di sentieri che si snodano tra le colline e i boschi. Culturalmente, la valle è punteggiata da borghi storici che conservano un patrimonio architettonico e storico significativo. Tra i più rinomati vi sono Millesimo, con il suo castello medievale e le stradine tortuose, e Garessio, che risale al periodo romano e vanta una ricca storia rinascimentale. Questi borghi sono testimoni di un passato ricco di tradizioni e di un'architettura che si è evoluta nel tempo, rappresentando un patrimonio culturale che attrae visitatori da tutto il mondo.

Casa del Parco Adamello

Nel paese di Cevo, a 1100 metri sul livello del mare in Valsaviore, si trova la Casa del Parco Adamello, un'originale struttura che combina le funzioni di ostello con cucina e centro culturale di montagna.
Situata lungo la strada da Cevo a Saviore, poco oltre il paese, spicca un imponente edificio dalle massicce mura in pietra e scuri turchesi. All'esterno, un ampio terrazzo offre un luogo di relax con vista sulle montagne circostanti. Accanto sorge una piccola chiesetta dismessa utilizzata per eventi, circondata da un grande giardino attraversato da un ruscello e un sentiero.
La Casa del Parco accoglie escursionisti e visitatori offrendo un'esperienza gastronomica basata su prodotti locali delle aziende agricole, oltre a funzioni culturali destinate sia ai visitatori che alla comunità locale.
Originariamente nota come Colonia Ferrari, la struttura ha cambiato scopo nel tempo, da colonia alpina a centro di educazione ambientale del Parco Regionale dell'Adamello sotto la gestione della Comunità Montana della Valcamonica, pur non ottenendo il successo sperato inizialmente.

Dati geografici:

Località: Cevo
Stato: Italia
Regione: Lombardia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 1.100 m s.l.m.
Numero di abitanti: 810

Dettagli del progetto e obiettivi:

Area: Val Bormida;
Periodo del progetto: 2023

Obiettivi:
- Promuovere il turismo sostenibile.
- Preservare e valorizzare il patrimonio culturale.
- Supportare l'economia locale.
- Educare sulla sostenibilità ambientale.
- Fungere da punto di incontro e di integrazione sociale.
- Promuovere il territorio.

Tematiche affrontate:

- Centro culturale di montagna;
- Riuso delle risorse locali;
- Valorizzazione dei beni isolati;
- Cultura, tradizione e innovazione.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Civita di Bagnoregio

Civita è una frazione del comune di Bagnoregio, in provincia di Viterbo, nel Lazio, facente parte dei borghi più belli d'Italia, famosa per essere denominata "La città che muore". Abitata da una decina di persone e situata in posizione isolata, è raggiungibile solo attraverso un ponte pedonale in cemento armato costruito nel 1965. Il ponte può essere percorso soltanto a piedi, ma recentemente ilcomune di Bagnoregio, ha permesso di attraversare il ponte a bordo di cicli e motocicli. La causa del suo isolamento è la progressiva erosione della collina e della vallata circostante è chiamata "la città che muore" o "il paese che muore". Un piccolo gioiello di architettura etrusca immerso in un'atmosfera altra, un mucchietto di case che dall'alto della loro privilegiata posizione godono dello spettacolo naturale che le circonda. Situata in provincia di Viterbo, nei pressi del lago di Bolsena e del confine umbro, Civita di Bagnoregio è ad oggi uno tra i borghi più antichi e più belli d'Italia. E forse proprio questa sua precarietà, il suo lento spegnersi davanti ai nostri occhi hanno contribuito a renderla tanto bella e affascinante. Motivo in più questo per visitare almeno una volta questo piccolo capolavoro urbano.

Smart Village Bagnoregio

Civita di Bagnoregio al centro dell'accordo che l'associazione fondata da Gianfranco Imperatori ha stretto con l'Università IUAV di Venezia, per creare qui un nuovo progetto sulla salvaguardia dei beni architettonici, storici e paesaggistici italiani, meta di docenti, esperti internazionali, studenti e intellettuali. Non solo con corsi e seminari per studenti e laureati, ma anche con una serie di tavole rotonde con esperti in campo architettonico, paesaggistico, sociologico italiani ed europei.
"Il paese che muore", come la chiamò lo scrittore Bonaventura Tecchi, vuole insomma diventare un modello per la conservazione e la tutela del paesaggio italiano, simbolo del borgo italiano, "modello di un futuro sostenibile dove la cura del bello, della storia della nostra identità possa unirsi allo sviluppo culturale ed economico che la nostra comunità insegue". 2 milioni di euro per il dissesto idrogeologico, garantiti a Civita di Bagnoregio grazie all'accordo di programma tra il Ministero dell'Ambiente e la Regione Lazio, ed un contributo della Presidenza del Consiglio dei Ministri di 850mila euro.

Dati geografici:

Località: Civita di bagnoregio
Stato: Italia
Regione: Lazio
Lingua: Italiano
Orario: Roma (CET)
Altitudine: 200 metri s.l.m.
Numero di abitanti: 3.303

Dettagli del progetto e obiettivi:

Importo del progetto: 2.850.000 €
Numero di villaggi coinvolti: 1
Periodo del progetto: 2011 - oggi

L'obiettivo dell'accordo tra l'associazione e l'Università IUAV di Venezia è quello di creare un nuovo progetto dedicato alla salvaguardia dei beni architettonici, storici e paesaggistici italiani. Questo attira docenti, esperti internazionali, studenti e intellettuali attraverso corsi, seminari e tavole rotonde con specialisti in architettura, paesaggistica, sociologia italiana ed europea. Conosciuta come "il paese che muore" secondo lo scrittore Bonaventura Tecchi, aspira a diventare un modello di conservazione e tutela del paesaggio italiano, simboleggiando il borgo italiano ideale. Integrare la cura del patrimonio storico e identitario con lo sviluppo culturale ed economico della comunità locale, aspirando a un futuro sostenibile.

Tematiche affrontate:

- Valorizzazione e fruizione del patrimonio architettonico;
- Workshop;
- Schedatura delle peculiarità architettoniche;
- Promozione turistica;
- Produzione cinametografica;
- Riduzione dissesto idrogeologico e accessibilità.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

CONCOREZZO - LOMBARDIA

Concorezzo

Concorezzo, è stata selezionata come unica località in Lombardia per entrare a far pare del progetto "Borghi del futuro", un programma promosso dal Ministero dello Sviluppo economico (Mise), dal Ministero dell'Università e della ricerca (Mur) e dal Ministro per l'Innovazione tecnologica e la digitalizzazione. Concorezzo è una cittadina che sembra essere nata durante l'età imperiale romana e che poi si è sviluppata nel periodo medioevale. Sorgendo lungo il tracciato che da Milano portava verso Vimercate ed Imbersago, Concorezzo occupava una posizione davvero strategica. Secondo antiche testimonianze questo piccolo borgo lombardo tra il IX e il X secolo si è dotato di un castello attorno al quale furono costruite diverse contrade. Ora il castello cittadino non è più presente e al suo posto, in Piazza della Pace, si trova Palazzo De Capitani, edificio costruito nel XVI secolo e attuale sede del municipio. Nella stessa Piazza si trova anche la Chiesa dei Santi Cosma e Damiano eretta in stile neoclassico ed affiancata da un campanile con cupola in rame realizzato nell'Ottocento. Al suo interno, a lato del fonte battesimale, si trovano due magnifici mosaici che raffigurano il Battesimo di Cristo. Nel centro cittadino sorgono diverse ville signorili ed eleganti, come Villa Pernice, Villa Teruzzi, e Villa Zoia. La città è ricca di diversi parchi pubblici.

Borgo del Futuro

"Smart Village", "Agroinnovazione" sono solo due dei concetti innovativi dei contesti abitativi, fuori dalle grandi città. In questa scia il progetto del Mise sui borghi: Alghero, Bardonecchia, Campobasso, Carbonia, Cetraro, Concorezzo, Ginosa, Grottammare, Otranto, Pantelleria, Pietrelcina e Sestri Levante: questi i 12 Comuni, con almeno 3.000 abitanti e al di sotto dei 60.000, scelti per diventare "Borghi del Futuro". L'obiettivo è quello di migliorare la vita delle comunità e dei cittadini attraverso la sperimentazione nei territori di soluzioni tecnologiche emergenti in diversi ambiti: mobilità, ambiente, benessere della persona e beni culturali. La sfida sarà quella di diventare laboratori di sperimentazione di tecnologie di frontiera applicate ai servizi per i cittadini, utilizzando un sistema di "appalti innovativi" con i quali, a differenza degli appalti tradizionali, lo Stato non acquista prodotti o servizi standardizzati già disponibili sul mercato, ma stimola operatori e imprese a creare soluzioni basate su tecnologie emergenti per rispondere concretamente ai fabbisogni di servizi espressi dalle realtà territoriali. Questo nuovo ecosistema di "appalti innovativi" spingerà il contesto imprenditoriale ad innovarsi e genererà un impatto rilevante sull'efficienza della Pubblica amministrazione.

Dati geografici:

Località: Concorezzo
Stato: Italia
Regione: Lombardia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 171 m s.l.m.
Numero di abitanti: 16.018

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: 2020 - oggi

I principali obiettivi del progetto includono:

- Sperimentazione di tecnologie emergenti.
- Appalti innovativi.
- Creazione di un ecosistema di innovazione.
- Impatto positivo sulla comunità.
- Promozione del modello "Smart Village": Diffondere il modello di "Smart Village" come esempio di come le aree rurali possono beneficiare dell'innovazione tecnologica per diventare più attrattive per i residenti e per i visitatori.

Tematiche affrontate:

- Smart Mobility;
- Valorizzazione dei beni culturali;
- Benessere sociale;
- Protezione dell'ambiente.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Craco

Una suggestivo quanto spettrale paese fantasma. Nel 1963 una frana che ha costretto i suoi abitanti a rifugiarsi nel nuovo comune di Craco Peschiera e Craco è diventata una meta turistica molto amata da visitatori di ogni parte del mondo. Della Craco vecchia oggi rimangono le case aggrappate alla roccia e in particolare la torre normanna, che svetta sulla parte più alta del borgo. La struttura di case arroccate attorno al torrione quadrato che domina il centro risale al periodo fra il 1154 e il 1168, durante il regno di Federico II. Nel 1276 il borgo fantasma di Craco è stato anche una sede universitaria. Successive invece le invasioni dei briganti, che, durante il decennio napoleonico, hanno attaccato la cittadina a più riprese, sia nel 1807 che nel 1861. La storia recente di Craco è segnata poi dalla disastrosa frana del 1963: il cedimento delle case e degli edifici del borgo non fu un evento repentino, ma lento, tanto che gli abitanti furono costretti ad abbandonare le proprie abitazioni nel 1974 per trasferirsi più a valle, a Craco Peschiera. La frana del 1963 non è stato però il primo evento naturale catastrofico a colpire il paese: già nel 1688, infatti, è stato registrato un terribile terremoto che ha avuto come epicentro Craco-Pisticci che ha portato alla formazione di alcune frane latenti su un territorio che già per propria natura è instabile.

Smart Village Craco

Costruire un nuovo attrattore culturale che potenzi l'offerta di visita di Craco Vecchia coinvolgendo attivamente i giovani. E' uno degli obiettivi del progetto Heritage Smart Lab, sostenuto dal cluster Basilicata Creativa con capofila il CNR della Basilicata e con la partecipazione dell'Università della Basilicata e dell'ENEA. Il Progetto è cofinanziato dalla Regione Basilicata nell'ambito del PO FESR 2014-2020 – RICERCA, INNOVAZIONE E SVILUPPO TECNOLOGICO. Va ricordato che Heritage Smart Lab mira a sviluppare prototipi, procedure e protocolli operativi nei settori della conoscenza, conservazione, valorizzazione e fruizione del patrimonio culturale attraverso il modello degli Smart Lab, veri e propri cantieri di sviluppo e cogenerazione attraverso il coinvolgimento di istituzioni, aziende del settore e cittadinanza attiva. Tra gli oltre venti cantieri che il Progetto si propone di attivare nei prossimi mesi sul territorio della Basilicata, Craco assolverà il ruolo primario sul tema della fruizione e dell'accessibilità ai siti culturali, accessibilità intesa nella sua più ampia accezione socio-culturale, fisica ed economica. A sostenere tale processo, lo SmartLab "Craco accessibile" implementerà sul sito tecnologie di fruizione basate sull'Intelligenza artificiale.

Dati geografici:

Località: Craco
Stato: Italia
Regione: Basilicata
Lingua: Italiano
Orario: Roma (CET)
Altitudine: 391 m s.l.m.
Numero di abitanti: 599

Dettagli del progetto e obiettivi:

Importo del progetto: Progetto cofinanziato
Numero di villaggi coinvolti: 1
Periodo del progetto: 2016 - oggi

Il progetto Heritage Smart Lab mira a creare un nuovo attrattore culturale a Craco Vecchia, incentivando la partecipazione attiva dei giovani. Capofila del progetto è il CNR della Basilicata, supportato da Basilicata Creativa, l'Università della Basilicata e l'ENEA. Finanziato dalla Regione Basilicata nell'ambito del PO FESR 2014-2020, il progetto si propone di sviluppare prototipi, procedure e protocolli operativi per la conoscenza, conservazione, valorizzazione e fruizione del patrimonio culturale tramite gli Smart Lab. In particolare, il "Craco accessibile" implementerà tecnologie basate sull'Intelligenza Artificiale per migliorare l'accessibilità socio-culturale, fisica ed economica dei siti culturali, svolgendo un ruolo centrale nel progetto con oltre venti cantieri attivati nella Basilicata nei prossimi mesi.

Tematiche affrontate:

- Accessibilità;
- Recupero del patrimonio storico-architettonico;
- Adeguamento strutturale;
- Fruizione e valorizzazione;
- Imprenditorialità giovanile.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

DOZZA - EMILIA-ROMAGNA

Dozza

A Dozza, l'arte si fa paesaggio urbano ed arreda i muri delle case, le strade e le piazze, inondando di luce e stili diversi ogni angolo ed aprendosi a squarci di colori improvvisi. Si tratta di un vero e proprio museo a cielo aperto, in cui si possono ammirare oltre un centinaio di opere realizzate da nomi prestigiosi dell'arte contemporanea. All'interno della Rocca sono conservati gli affreschi e i bozzetti delle opere su muro esposti nel Centro Studi e Documentazione del Muro Dipinto. Il territorio comunale risulta abitato fin dall'età del bronzo come testimoniano reperti rinvenuti nella zona di Toscanella. Assoggettato ai Galli e poi ai Romani, nel XII secolo Dozza era sotto il dominio della Chiesa imolese, per poi ergersi a comune autonomo. Dopo essere stata saccheggiata dai soldati di Ottone IV di Sassonia la cittadina passò sotto il dominio prima dei bolognesi e quindi degli imolesi. Ad opera del cardinale Albornoz (1361) tornò nuovamente sotto il dominio della Chiesa, per divenire nel XV secolo terra di conquista per importanti famiglie. Il territorio venne sottomesso alla Santa Sede nel 1505, e ceduto dal pontefice al cardinale Campeggi la cui casata ne mantenne il dominio fino all'estinzione, avvenuta nel 1728. Subentrò infine un'altra famiglia bolognese, i marchesi Malvezzi, l'attuale aspetto della rocca si deve a loro che nel 1594 ha ristrutturato il maniero, fino al 1960.

Dozza, Museo a cielo aperto

Annoverato tra i Borghi più belli d'Italia, questo paese sembra non subire le leggi del tempo. Il fascino antico e autentico, che si percepisce passeggiando tra le strade, è immediatamente tangibile già all'accesso del borgo. La storia d'amore tra Dozza e i murales affonda le radici in tempi lontani. Era il 1960 quando fu organizzata la prima edizione della Biennale del Muro Dipinto da un'idea di Tomaso Seragnoli, appuntamento imperdibile che ha cambiato il volto del borgo e che continua a trasformarlo. Sulle case dozzesi ci sono i murales, gli affreschi e rilievi che si fondono con le storie, le tradizioni e l'atmosfera dell'antico paesino medievale. Sono sulle porte delle botteghe, sui portoni delle case e sono sulle finestre. L'arte e il borgo sono un'unica cosa, un museo a cielo aperto senza orari o limiti d'ingresso. Dozza, vanta più di novanta opere d'arte. Accanto a questi murales ci sono i titoli e gli autori delle opere, mentre la spiegazione è lasciata all'osservatore. Alcune di queste sono più immediate e riconducibili alla storia del borgo, altre sono lasciate libere di essere assoggettate ai pensieri e alle interpretazioni di chi da queste si lascia suggestionare. Non c'è un itinerario preciso da seguire, né tantomeno una guida da ascoltare, l'unica regola è quella di camminare, di perdersi e immergersi tra le stradine e i vicoli mentre lo sguardo vaga a destra, a sinistra, in alto e in basso.

Dati geografici:

Località: Dozza
Stato: Italia
Regione: Emilia - Romagna
Orario: Roma (CER)
Altitudine: 190 m s.l.m.
Numero di abitanti: 6.550

Dettagli del progetto e obiettivi:

Area: Bologna
Periodo del progetto: 2013; oggi

Obiettivi:
- Preservare il fascino storico.
- Promuovere l'arte pubblica.
- Favorire il turismo culturale.
- Stimolare l'interesse storico-culturale.
- Sostenere l'identità locale.

Tematiche affrontate:

- Street Art;
- Murales;
- Recupero del patrimonio storico-architettonico.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Erice

Erice è un delizioso Borgo medievale arroccato sulla cima del monte omonimo. Situato sulla costa occidentale siciliana, sotto la provincia di Trapani, a 13 km dal capoluogo. Caratterizzato dall'accostamento di diversi stili architettonici: medievale, arabo, barocco, Liberty, a testimonianza della storia antica, quanto tortuosa di questo piccolo borgo. Al suo interno troverete torri di avvistamento, monasteri, porte, un misterioso castello e più di sessanta chiese, il tutto racchiuso da mura ciclopiche. Conta 512 abitanti, ma durante il periodo estivo le sue vie si riempiono di vita. Turisti da ogni dove giungono qui, alla ricerca di storia, buon cibo e tanta bellezza. Nel 1241 il territorio di Erice era assai più vasto di come oggi lo conosciamo. L' area era denominata Agro Ericino e comprendeva al suo interno: la Valderice, parte di Castellammare del Golfo, San Vito lo capo, Custonaci e Buseto Palizzolo. Fino al 1846 l'Agro Ericino si estendeva per 40.000 ettari con un litorale di oltre 26 miglia; alla fine dell'800 gran parte del territorio venne attribuito a Castellammare del Golfo. Il borgo è un intreccio di strade piccole e strette che si aprono su scenari mozzafiato, delle vere e proprie terrazze panoramiche sul Mar Mediterraneo. Le case hanno bellissimi cortili interni intimamente difesi dalla vista dei passanti, in un'atmosfera tranquilla e silenziosa, quasi surreale.

Smart Village Erice

La creazione di un sistema di informazioni e servizi on line per cittadini ed imprese attivo 24 ore su 24, che consentirà di interagire con il Comune direttamente da casa. E' questo l'obiettivo principale del nuovo Portale "Servizi ONLINE", lo "Sportello telematico polifunzionale del Comune di Erice" che consentirà agli utenti di richiedere e stampare i propri certificati anagrafici, di conoscere con un semplice clic la propria situazione tributaria, di pagare on line alcuni servizi a domanda individuale, di effettuare delle segnalazione geo localizzate corredate da foto, insomma un punto di accesso unificato per tutti i servizi e le informazioni del Comune e del territorio sempre aggiornato, utilizzabile anche attraverso il proprio smartphone attraverso l'innovativa applicazione "Municipium". il progetto Erice Smart Evo (Azione 2.2.1) ha lo scopo di potenziare e ampliare le attuali dotazioni software, per favorire l'interazione tra Ente e utenti potenziali. Ese coprirà le aree di servizi attualmente sprovviste di canali di accesso digitali utilizzate, in modo diretto, dai cittadini o utilizzati dai loro delegati.

Dati geografici:

Località: Erice
Stato: Italia
Regione: Sicilia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 751 m s.l.m.
Numero di abitanti: 500

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: 2017 - 2019.

Obiettivi:
- Richiesta e stampa di certificati anagrafici.
- Consultazione della situazione tributaria.
- Pagamento online di servizi a domanda individuale.
- Segnalazioni geo-localizzate.
- Punto di accesso unificato.

Tematiche affrontate:

- Migliorare la vitalità del villaggio;
- Digitalizzazione;
- Fruizione turistica.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

GARGANO - PUGLIA

Gargano

Il Parco Nazionale del Gargano è una delle aree naturalistiche protette più estese d'Italia, con oltre 118.000 ettari di territorio. È caratterizzato da una straordinaria biodiversità che lo rende un'importante oasi biologica. Il paesaggio varia dalle alte coste rocciose agli altipiani carsici, dalle gole boscose ai laghi costieri, dalle foreste alla steppa, includendo anche zone di deserto. Il parco ospita oltre 2200 specie di flora, rappresentando circa il 35% del patrimonio floreale italiano. Le faggete plurisecolari a 300 metri sul livello del mare sono tra le più basse d'Europa. Il sottobosco è ricco di piante e fiori, inclusi numerosi tipi di orchidee, con il parco vantando il maggior numero di specie dell'Europa e del Mediterraneo.
Verso valle, l'ambiente cambia e predomina la steppa, con fichi d'india, euforbie e iris, ospitando il fungo Pleurotus eringi. Tra le specie faunistiche più significative vi è il Capriolo Garganico, simbolo del parco e uno dei pochi nuclei autoctoni presenti in Italia. Altre specie mammifere includono il cinghiale, la donnola, il daino, la faina, il gatto selvatico, il riccio, la talpa e la lepre. Nelle zone umide si possono osservare l'airone rosso, oche selvatiche, mentre nelle zone paludose sono presenti numerose specie di rettili e anfibi.

Smart Village Santa Fiora

Gargano Natour, nato come brand nel 2016, si è trasformato in un'associazione APS nel 2023, unendo guide turistiche, esperti ambientali e un direttore di agenzia di viaggi. Questa collaborazione ha generato un'entità poliedrica con competenze che spaziano dall'archeologia al web-marketing. L'associazione non solo offre servizi di accompagnamento turistico, ma si impegna attivamente nella promozione di progetti culturali e sostenibili, con una particolare attenzione alla conservazione del patrimonio ambientale e culturale del Gargano. Utilizzando avanzate strategie di web-marketing, l'associazione mira a raggiungere un pubblico più ampio, promuovendo un turismo consapevole e responsabile. In sintesi, Gargano Natour è un punto di riferimento per esplorare il Gargano con guide esperte e, come associazione, si impegna nella valorizzazione e conservazione di questo ricco territorio, offrendo un'esperienza turistica unica e autentica.

Dati geografici:

Località: Parco del Gargano
Stato: Italia
Regione: Puglia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 300 - 800 m s.l.m.

Dettagli del progetto e obiettivi:

Area: Parco Nazionale del Gargano;
Periodo del progetto: 2023

Obiettivi:
Utilizzando strategie avanzate di web-marketing, Gargano Natour mira a raggiungere un pubblico più ampio, promuovendo un turismo consapevole e responsabile. In sintesi, l'associazione è un punto di riferimento per esplorare il Gargano con guide esperte e si impegna nella valorizzazione e conservazione di questo territorio, offrendo un'esperienza turistica autentica e unica.

Tematiche affrontate:

- Trekking esplorativi;
- Conoscenza del territorio.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Gibellina

piccolo comune situato nella provincia di Trapani, in Sicilia. La sua storia recente è particolarmente legata al terremoto del Belice, avvenuto nel gennaio 1968, che distrusse quasi completamente il paese. Dopo la tragedia, Gibellina non fu ricostruita nello stesso luogo, ma fu edificata una nuova città a pochi chilometri di distanza, chiamata Gibellina Nuova.
Una delle caratteristiche più emblematiche di Gibellina è il Cretto di Burri, un'opera monumentale creata dall'artista Alberto Burri negli anni '80. Questo intervento artistico copre le rovine del vecchio paese, trasformando le macerie in un simbolo di memoria e arte contemporanea. Gibellina Nuova è diventata così un luogo di sperimentazione architettonica e artistica, ospitando numerose opere di artisti italiani e internazionali.
Il comune è oggi conosciuto per il suo impegno nella promozione culturale, con un focus sull'arte contemporanea e la memoria del sisma.

Cretto di Burri

Gibellina rappresenta un esempio significativo di smart village grazie alla sua capacità di trasformare una tragedia in un'opportunità di rinascita innovativa e sostenibile. Dopo il devastante terremoto del 1968, la città è stata ricostruita non solo fisicamente, ma anche culturalmente, diventando un laboratorio a cielo aperto di arte contemporanea. L'opera monumentale del Cretto di Burri ha giocato un ruolo centrale in questo processo, trasformando le macerie del vecchio borgo in un simbolo di memoria e rigenerazione.
Oltre a preservare la storia attraverso l'arte, Gibellina ha adottato strategie intelligenti per valorizzare le risorse locali, combinando cultura, innovazione sociale e turismo sostenibile. Attraverso festival e iniziative artistiche, la comunità è stata coinvolta attivamente nella promozione del territorio, dimostrando come l'integrazione sociale e culturale possa migliorare la qualità della vita e rafforzare il senso di appartenenza.
Con un'attenzione crescente alla connettività digitale e al potenziamento delle infrastrutture, Gibellina si avvia a diventare un modello di smart village, dove passato e futuro si incontrano, offrendo nuove opportunità per lo sviluppo sostenibile e la resilienza della comunità.

Dati geografici:

Località: Gibellina
Stato: Italia
Regione: Sicilia
Lingua: Italiano
Orario: Roma (CET)
Altitudine: 233 m s.l.m.
Numero di abitanti: 3.712

Dettagli del progetto e obiettivi:

Area: Valle del Belice, Sicilia
Periodo del progetto: 1984-1989
Investimento: Circa 3 milioni di euro

Obiettivi:
- Partecipazione della comunità.
- Promozione territoriale.
- Modello circolare di gestione delle risorse.
- Rigenerazione territoriale.
- Collaborazione multidisciplinare.

Tematiche affrontate:

- Memoria, arte e tradizione;
- Recupero del patrimonio storico;
- Rigenerazione rurale;
- Partecipazione comunitaria;
- Sostenibilità e riutilizzo delle risorse;
- Land art.

* Recalcati, M. (2018). Alberto Burri. Il Grande Cretto di Gibellina. ISBN 978-88-98756-68-1.

LAURENZANA - BASILICATA

Laurenzana

Laurenzana, località climatica montana, in bella e panoramica posizione sulla val Camastra a 850 metri di altitudine, è un piccolo gioiello d'arte, cultura e natura, incastonata fra le boscose montagne dell'Appennino Lucano che, nel suo territorio, raggiungono i 1.456 mt di altezza con il monte Caperrino. Il nucleo antico di origine medievale, è dominato dalla mole del Castello e dalla Chiesa Madre che sorgono su due speroni. Buona parte del contado comunale fa parte del Parco Nazionale dell' "Appennino Lucano Val d'Agri Lagonegrese"; fiore all'occhiello del parco è l'Abetina di Laurenzana.
Il centro storico, ai piedi delle due rupi del Castello e della Chiesa Matrice, presenta una morfologia e una viabilità suggestiva: archi a sottopasso delle abitazioni, edicole votive, viuzze strette dette "strèttele", case in pietra e palazzi nobiliari. Largo Fiera e i vicoli vicini, agli inizi del 900, costituivano un "borgo azienda" con magazzini e opifici che ruotavano intorno al nucleo centrale dell'Antica Filanda De Rosa, oggi testimonianza di archeologia industriale con macchinari, attrezzature e arnesi rimasti inalterati come al tempo del loro massimo utilizzo, quando trasformavano la produzione locale di lana in filati e tessuti.

Case a "1 euro"

Il fenomeno delle case a un euro torna d'attualità con il rogito annunciato dal comune di Laurenzana in Basilicata, il primo da quando il progetto è stato reso pubblico. Un'iniziativa che ha avuto risonanza mediatica nazionale e mondiale, attirando addirittura l'attenzione della tv americana Cnn. C'è però da dire che a Laurenzana, a differenza di altri comuni aderenti, non è previsto alcun deposito cauzionale alla stipula del contratto proprio per aiutare e incentivare gli acquirenti e favorire il proprio investimento evitando adempimenti burocratici o requisiti troppo stringenti. Ad aggiudicarsi la casa è stato il titolare di uno studio tecnico a Casalvieri, nel Frusinate. L'immobile acquistato diventerà ora un albergo "per permettere a tutti di godere delle bellezze di questo luogo", ha spiegato il nuovo proprietario. "Ho scoperto il progetto navigando in internet poi mi sono fatto incantare dai paesaggi immersi nel verde di Laurenzana, un luogo in cui rigenerarsi". Il progetto 'Case a 1 euro' è rivolto a chiunque (cittadini italiani e stranieri, imprese, associazioni) con l'obiettivo di "recuperare spazi urbani degradati ed abbandonati rivitalizzando il paese. Gli immobili proposti alla cifra simbolica di un euro sono in gran parte fatiscenti e necessitano di interventi di ristrutturazione di importo pari ad almeno 80, 90mila euro.

Dati geografici:

Località: Laurenzana
Stato: Italia
Regione: Basilicata
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 850 m s.l.m.
Numero di abitanti: 1.565

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: 2023

Obiettivi:
- Recupero urbano.
- Rivitalizzazione del paese.
- Incentivazione degli acquirenti.
- Promozione turistica.
- Sostenibilità economica e sociale.

Tematiche affrontate:

- Recupero degli edifici in disuso.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Nurghedu Santa Vittoria

Nughedu Santa Vittoria è un comune italiano di 466 abitanti della provincia di Oristano in Sardegna, nella regione storica del Barigadu.
Centro del Barigadu a 50 chilometri da Oristano, nella Sardegna centro-occidentale, caratterizzato da natura rigogliosa, chiese antiche e radicate tradizioni.
Abbarbicato su un costone di roccia vulcanica, tra querce, roverelle e macchia mediterranea, si affaccia sullo splendido scenario del lago Omodeo, a ridosso dell'imponente Santa Vittoria, monte che è all'origine del toponimo insieme a nocetum, a indicare una zona in passato ricca di alberi di noce. Nughedu Santa Vittoria, piccolo centro agricolo di 500 abitanti del Barigadu, ai confini nord-orientali della provincia di Oristano, offre sorprendenti tratti naturalistici, specie spettacolari guglie e massi granitici dalle forme bizzarre che svettano tra verde, sorgenti e torrenti. Il monte è impreziosito dal bosco di lecci e sughere secolari d'Assai, che ospita un'oasi faunistica con cervi e daini. In località Alamoju c'è il museo oasi d'Assai, dove sono esposti mammiferi e volatili impagliati, tra cui l'aquila reale, una xiloteca, una collezione di minerali e fossili ed è riprodotto un 'angolo' di foresta.

Smart Village Santa Fiora

Nel 2019 viene pubblicata una call della società cooperativa Sardarch, laboratorio di ricerca che studia le trasformazioni urbane e territoriali. La società cerca un "community manager" per il progetto SpopLab a Nughedu Santa Vittoria. Il progetto Spop Lab è il primo progetto di ricerca-azione di community management in Italia e ha lo scopo di organizzare le risorse del paese, coinvolgendo i cittadini, valorizzando il potenziale di ogni soggetto e motivandolo all'impegno. Si tratta di un progetto residenziale in un paese di 400 abitanti, in cui strutturare laboratori e animare il territorio grazie all'esperienza al GAL- L'arrivo di una community manager ha una forza dirompente nell'alterare gli equilibri di una comunità locale, guidando la costruzione di una visione collettiva di futuro. Lo sviluppo che promuove mette al centro le persone: è la comunità ad essere motore del cambiamento e portatrice di risorse e capacità. Si tratta allora di creare spazi capacitanti per attivare le competenze che già esistono sul territorio e generare nuove connessioni.
Una parte delicata del lavoro di una community manager è la costruzione della fiducia nella propria figura. Completa sconosciuta, si insedia in un territorio magari ancorato alle proprie tradizioni e disabituato alla presenza dell' "altro".

Dati geografici:

Località: Nurghedu Santa Vittoria
Stato: Italia
Regione: Sardegna
Lingua: Italiano, sardo
Orario: Roma (CER)
Altitudine: 533 m s.l.m.
Numero di abitanti: 426

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 1 città;
Periodo del progetto: 2023
Obiettivi:

- Organizzazione delle risorse locali.
- Valorizzazione del potenziale individuale.
- Costruzione di una visione collettiva di futuro.
- Creazione di spazi capacitanti.
- Costruzione della fiducia e integrazione.

Tematiche affrontate:

- Community Manager;
- Sviluppo rurale;
- Capacity building.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

OLLOLAI - SARDEGNA

Ollolai

Ollolai sarebbe stata residenza di Ospitone, dux dei barbaricini, così riconosciuto in una lettera ufficiale (594 d.C.) da papa Gregorio Magno che gli chiedeva aiuto per incoraggiare il suo popolo alla conversione. Oggi, popolato da 1.500 abitanti, dà nome al territorio storico di cui è centro principale, la Barbagia di Ollolai. L'asfodelo è materia prima per l'arte d'intreccio: cestini realizzati dalle abili mani delle donne ollolaesi nella mostra de s'iscrarionzu. Famose sono le case in granito con portali in pietra scura, disposte intorno alla parrocchiale di san Michele arcangelo, un tempo gotico-aragonese, poi più volte rimaneggiata. Custodisce anche alcuni dipinti di Carmelo Floris, che ritrasse le donne ollolaesi negli splendidi abiti tradizionali. Il patrono è celebrato due volte: a inizio maggio e a fine settembre. A metà gennaio, per sant'Antonio abate, sono offerti vino e il dolce tipico, su pistiddu. La festa di san Bartolomeo, a fine agosto, è la più sentita. A luglio il palio degli asinelli vede sfidarsi i cinque rioni storici del paese. L'abitato, immerso nel verde di macchia mediterranea, querce, tassi e lecci secolari e irrorato da una miriade di sorgenti, si inerpica a quasi mille metri d'altitudine sulle pendici del monte Santu Basili. Nel parco archeologico di Santu Basili risiedono le radici di Ollolai. Il territorio è punteggiato da altri nuraghi.

Nomadi Digitali - Ollolai Capitale

Ollolai è un piccolo borgo della Sardegna centrale molto gettonato dai remote worker. Il Comune ha preso la decisione, per combattere lo spopolamento, di mettere le case in vendita ad un euro, a condizione di donargli una nuova vita. Migliaia di richieste sono pervenute in pochissimo tempo ed è diventato metà di tanti smart worker, tra cui diversi stranieri. L'obbiettivo finale del progetto, chiamato Ollolai Capitale, è quello di realizzare con uno stanziamento della Regione aree di coworking e centri polifunzionali con spazi culturali ed informativi, rendendo il borgo sempre più attrattivo per i giovani. Un progetto che ben si integra con il finanziamento di una società londinese, realizzato per attirare investitori stranieri con lo scopo di riqualificare gli immobili per poi rivenderli. Nel bel mezzo della Barbagia c'è un borgo che conta poco più di mille abitanti, ma che è diventato famoso in tutto il mondo. È qui che negli ultimi 12 mesi si sono trasferiti tantissimi smart worker provenienti da Gran Bretagna e Stati Uniti in cerca di distanziamento. Ollolai è stato uno dei primi borghi a vendere le proprie case a un euro ed è diventato la sede prediletta di manager e imprenditori di tutto il mondo che, dopo aver acquistato casa qui, vi si sono trasferiti a fare smart working.

Dati geografici:

Località: Nuoro
Stato: Italia
Regione: Sardegna
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 970 m s.l.m.
Numero di abitanti: 33.324

Dettagli del progetto e obiettivi:

Area: Sardegna
Periodo del progetto: 2020 - oggi
Finanziamento: 4.439.700 di euro
Obiettivi:

- Ripopolamento del borgo.
- Creazione di spazi di coworking e centri polifunzionali.
- Attrazione di investimenti stranieri.
- Promozione internazionale.
- Sostenibilità e sviluppo locale.

Tematiche affrontate:

- Smart working.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Pinerolo

Pinerolo è un popoloso insediamento rurale, diffuso sul territorio e articolato in almeno tre borgate, intorno ad altrettante piccole chiese di campagna e al suo castello. Nel 1064 la potente contessa Adelaide decide di fondare proprio qui, nella borgata di San Verano, un monastero di benedettini dedicato alla Vergine, le cui ricchezze faranno affluire a Pinerolo artigiani e mercanti, trasformandola da villaggio rurale in una piccola capitale, impegnata nella principale attività manifatturiera dell'epoca, la produzione tessile, e in altre industrie tipiche delle città tardomedievali, basate soprattutto sull'impiego della forza idraulica come la produzione della carta e dei metalli. In epoca napoleonica continua la crescita dell'industria tessile pinerolese, anche grazie alle committenze dell'esercito imperiale, e accanto all'industria laniera e a quella della seta prosperavano le cartiere e soprattutto la tipografia. La costruzione della ferrovia Torino-Pinerolo, inaugurata nel 1854, sancì la piena integrazione della città e del suo entroterra nel nascente sistema industriale del Nord-Ovest, e negli stessi anni la trasformazione urbanistica seguì da vicino la crescita della città, cominciando a darle il volto che si riconosce ancor oggi. Con le riforme dei primi governi unitari la città cominciò ad assumere anche il ruolo di polo scolastico per un vasto territorio di montagna e di pianura.

Smart Village Santa Fiora

In Piemonte, il Consorzio Pinerolo Energia (CPE), sta ponendo le basi per realizzare una comunità energetica tra diversi comuni di Torino: hanno ridotto la produzione di energia da fonti fossili portando la loro capacità di autoproduzione energetica al 42%. Il nucleo di partenza della futura Comunità Energetica è costituito dai Comuni di Cantalupa, Frossasco, Roletto, San Pietro Val Lemina, Scalenghe e Vigone con i rispettivi cittadini e da 5 aziende membri del Consorzio CPE. Sono 162, tra pubblici e privati, gli impianti previsti in grado di soddisfare i fabbisogni energetici locali per una produzione di energia elettrica da rinnovabili di circa **16,9 GWh/anno**. Tale contributo arriverà dall'**impianto idroelettrico da 450 kW** di Inverso Pinasca e da un **impianto a biogas**, generato dal trattamento dei rifiuti organici, in grado di produrre circa l'80% del fabbisogno energetico della comunità generando circa 10 milioni di metri cubi di biogas all'anno, da cui verranno prodotti circa **17,1 GWh/anno di energia elettrica**. **144 gli impianti fotovoltaici da 3 kW**, ciascuno distribuiti tra le utenze private, per coprire il 3% dei fabbisogni insieme ad ulteriori 13 di proprietà pubblica e privata con una potenza variabile tra gli 8,4 kW a 62 kW. A questi si aggiunge un ulteriore impianto fotovoltaico, di proprietà API, **da 113 kW e in grado di produrre 114 MWh/anno circa.**

Dati geografici:

Località: Pinerolo
Stato: Italia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 225 m s.l.m.
Numero di abitanti: 35.525

Dettagli del progetto e obiettivi:

Area: Piemonte
Periodo del progetto: 2018 - oggi
Investimento: privato
Obiettivi:

- Riduzione delle fonti fossili.
- Creazione di una Comunità Energetica.
- Produzione di energia da fonti rinnovabili.
- Utilizzo dell'idroelettrico e del biogas.
- Installazione di impianti fotovoltaici.
- Sostenibilità e autosufficienza energetica.

Tematiche affrontate:

- Comunità energetica.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

RURAL FVG - FRIULI VENEZIA GIULIA

Fondazione Pietro Pittini

Percorsi Spericolati è un percorso immersivo per conoscere e supportare alcune realtà imprenditoriali locali particolarmente innovative che operano principalmente nei settori dell'agricoltura, dell'hospitality, del turismo ma anche dell'artigianato. Il programma, rivolto ai giovani selezionati dalla call, prevede l'utilizzo di nuovi strumenti della comunicazione digitale applicata alla rigenerazione territoriale delle aree cosiddette al margine. Percorsi Spericolati è una formazione dedicata ai giovani under 30 che vogliono promuovere lo sviluppo delle aree interne, ma è anche molto di più. È un'occasione di incontro con le realtà imprenditoriali che hanno scelto di abitare i margini del Friuli Venezia Giulia e portarvi innovazione e nuove economie. I partecipanti acquisiranno competenze che spaziano dallo storytelling alla progettazione, dal fundraising al community engagement, imparando a narrare le peculiarità dei territori attraverso i nuovi linguaggi digitali. Poi la teoria si sposerà felicemente con la pratica: suddivisi in piccoli team, lavoreranno a un progetto di valorizzazione e comunicazione per le realtà imprenditoriali innovatrici radicate nelle aree interne del Friuli Venezia Giulia.

Percorsi spericolati

Percorsi Spericolati nasce con l'obiettivo di valorizzare e promuovere l'operato di piccole realtà imprenditoriali della montagna del Friuli Venezia Giulia attraverso il coinvolgimento attivo di un gruppo di ragazze e ragazzi provenienti da tutta Italia. Lo scopo è quello di contribuire a creare una nuova narrativa e sensibilizzare sul fatto che vivere, lavorare e fare impresa al margine è possibile e che l'innovazione può nascere e fiorire anche nei luoghi più impervi.
La prima edizione del percorso formativo, svoltasi nel 2022, è stata un successo: oltre 100 candidature, 22 giovani selezionati provenienti da 9 regioni diverse, 90 ore di attività e 10 imprese partner.
Percorsi spericolati è realizzato dalla Fondazione Pietro Pittini con il supporto dell'Associazione Meraki – Desideri Culturali e dell'Associazione di Promozione Sociale Rob de Matt. Collaborano attivamente al progetto la Cooperativa Sociale Cramars, Avanzi – Sostenibilità per azioni e la Rete Rifai. Percorsi Spericolati gode del patrocinio di Legacoop FVG e Confcooperative Alpe-Adria.

Dati geografici:

Località: Friuli Venezia Giulia
Stato: Italia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 225 m s.l.m.

Dettagli del progetto e obiettivi:

Area: Friuli Venezia Giulia
Periodo del progetto: 2023 - oggi
Associazioni: Avanzi - Sostenibilità per azioni
Obiettivi:

- Valorizzazione delle piccole realtà imprenditoriali della montagna.
- Coinvolgimento attivo dei giovani.
- Creazione di una nuova narrativa.
- Promozione dell'innovazione e della sostenibilità.
- Collaborazioni e partenariati.
- Riconoscimenti e sostegno istituzionale.

Tematiche affrontate:

- Imprese al margine;
- Esplorazione dei luoghi montani.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Santa Fiora

Santa Fiora è un paesino medievale sul Monte Amiata in provincia di Grosseto. È Bandiera arancione del Touring club e nella lista dei "Borghi più belli d'Italia". Ma oggi la sua fama è legata soprattutto al lavoro agile: è stato il primo centro a proporsi come borgo smart durante la pandemia. Con il passaparola, sono arrivati cittadini da tutto il mondo. Ed è solo l'inizio di un progetto di rinascita che ha in serbo novità per imprese e start up.
Borgo di appena 2.500 anime arrampicato sulle pendici grossetane del Monte Amiata, è salito all'onore delle cronache internazionali (con menzioni perfino su CNN e Forbes) per essersi offerto in piena pandemia come smart working village a uso di chi cercava un rifugio lavorativo. Oggi il paese - Bandiera arancione del Touring club e nella lista dei Borghi più belli d'Italia ma, fino a ieri, quasi spopolato - è un caso. Dove i forestieri arrivano a frotte.
Merito, da un lato, di una fibra ottica che ha colmato il divario tecnologico tra campagna e città, dall'altro di un'intuizione del sindaco, Federico Balocchi, che ha visto nella difficoltà dell'emergenza sanitaria mondiale, le premesse per una rinascita sociale ed economica che sembra non fermarsi più.

Smart Village Santa Fiora

Sono stati quasi una trentina i nuclei familiari (molti dei quali provenienti dall'Italia settentrionale e dall'estero) che in 18 mesi hanno vissuto l'esperienza dell'insediamento temporaneo e si sono dati il cambio negli alloggi sfitti del paese, in alcuni casi traslocando definitivamente.
Santa Fiora diventa la prima e forse l'unica municipalità del pianeta a mettere a disposizione della gente non solo singole abitazioni, ma l'intero comune.
Per invogliare i nuovi concittadini pro tempore si pensa innanzitutto a un incentivo economico, con un contributo comunale sulle spese di affitto, e a un sito internet semplice e chiaro, con tutte le informazioni necessarie.
I primi a restare sorpresi di tanto successo, dopo qualche scetticismo, sono stati proprio i santafioresi. I quali però hanno fatto presto ad adeguarsi alle facce nuove e al benessere portato dal nuovo corso. Il mercato immobiliare, nel centro storico come nelle frazioni, si è improvvisamente rianimato. Le seconde case, prima impolverate e trascurate per il disuso, hanno ripreso a splendere. E gli affari hanno ricominciato a girare sotto la spinta della microimprenditoria locale.

Dati geografici:

Località: Santa Fiora
Stato: Italia
Regione: Toscana
Lingua: Italiana
Orario: Roma (CET)
Altitudine: 687 m s.l.m.
Numero di abitanti: 2.484

Dettagli del progetto e obiettivi:

Importo del progetto: 1.600.000 €
Numero di villaggi coinvolti: 1
Periodo del progetto: 2 anni

Gli obiettivi del progetto di Santa Fiora possono essere sintetizzati nei seguenti punti:

- Attrarre nuovi residenti.
- Promuovere l'insediamento permanente.
- Incentivi economici.
- Sito web informativo.
- Rilancio del mercato immobiliare.
- Sostegno alla microimprenditoria locale.

Tematiche affrontate:

- Smart working.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

SESTRI LEVANTE - LIGURIA

Sestri Levante

Sestri Levante è un borgo ricco di storia e cultura, fonte da sempre d'ispirazione per poeti e scrittori. Il centro storico si affaccia su due baie: La baia più grande, detta Baia delle Favole e la seconda, più piccola, è la celebre Baia del Silenzio. Celebre per l'inconfondibile morfologia del suo territorio. La baia più grande, detta Baia delle Favole, deve il nome ad Enzo Tortora, indimenticabile presentatore televisivo che così la battezzò durante una puntata di Campanile Sera, andata in onda proprio da Sestri Levante verso la fine degli anni conquante. La seconda baia, più piccola, è la celebre Baia del Silenzio, così chiamata per la prima volta nel 1919 da Giovanni Descalzo, il poeta ligure vissuto a Sestri. Conosciuta come Segesta o Segeste, è stata fondata dai Liguri Tigulli. Durante l'epoca romana visse un grande periodo di splendore che andò a decadere nel medioevo con le invasioni barbariche, periodo in cui l'abitato cominciò ad espandersi sulla terraferma. Dopo essere stata feudo dei Fieschi, conti di Lavagna, nel 1100 passò sotto la repubblica marinara di Genova, che vi costruì un castello a scopo difensivo. Nel corso del Duecento fu scelta come capoluogo della locale podesteria per poi subire, nel secolo successivo, due tentativi di assedio: il primo nel 1327, da parte dal signore lucchese Castruccio Castracani, e il secondo dalla famiglia Visconti nel 1365.

Borgo del Futuro

"Smart Village", "Agroinnovazione" sono solo due dei concetti innovativi dei contesti abitativi, fuori dalle grandi città. In questa scia il progetto del Mise sui borghi: Alghero, Bardonecchia, Campobasso, Carbonia, Cetraro, Concorezzo, Ginosa, Grottammare, Otranto, Pantelleria, Pietrelcina e Sestri Levante: questi i 12 Comuni, con almeno 3.000 abitanti e al di sotto dei 60.000, scelti per diventare "Borghi del Futuro". L'obiettivo è quello di migliorare la vita delle comunità e dei cittadini attraverso la sperimentazione nei territori di soluzioni tecnologiche emergenti in diversi ambiti: mobilità, ambiente, benessere della persona e beni culturali. La sfida sarà quella di diventare laboratori di sperimentazione di tecnologie di frontiera applicate ai servizi per i cittadini, utilizzando un sistema di "appalti innovativi" con i quali, a differenza degli appalti tradizionali, lo Stato non acquista prodotti o servizi standardizzati già disponibili sul mercato, ma stimola operatori e imprese a creare soluzioni basate su tecnologie emergenti per rispondere concretamente ai fabbisogni di servizi espressi dalle realtà territoriali. Questo nuovo ecosistema di "appalti innovativi" spingerà il contesto imprenditoriale ad innovarsi e genererà un impatto rilevante sull'efficienza della Pubblica amministrazione.

Dati geografici:

Località: Sestri Levante
Stato: Italia
Regione: Liguria
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 1 m s.l.m.
Numero di abitanti: 17.257

Dettagli del progetto e obiettivi:

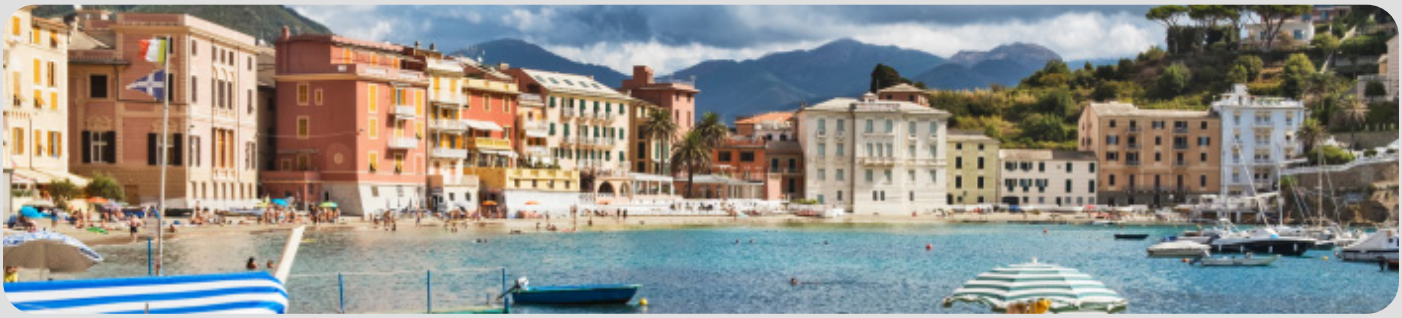
Numero di villaggi coinvolti: 1 villaggio;
Periodo del progetto: 2020 - oggi.

I principali obiettivi del progetto includono:

- Sperimentazione di tecnologie emergenti.
- Appalti innovativi.
- Creazione di un ecosistema di innovazione.
- Impatto positivo sulla comunità.
- Promozione del modello "Smart Village": Diffondere il modello di "Smart Village" come esempio di come le aree rurali possono beneficiare dell'innovazione tecnologica per diventare più attrattive per i residenti e per i visitatori.

Tematiche affrontate:

- Smart Mobility;
- Valorizzazione dei beni culturali (Cultural Heritage);
- Benessere sociale;
- Protezione dell'ambiente.



* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

CO-HOUSING del moro

Tassignano

Tassignano fa parte del comune di Capannori, in provincia di Lucca, nella regione Toscana.
Ogni città ha le sue tradizioni e a Capannori ogni anno si svolge un evento che coinvolge milioni di persone provenienti da varie città d'Italia, ovvero le "Fiorite". Questa tradizione si rinnova ogni anno per celebrare il Corpus Domini. Il Comune "fiorisce" grazie alla presenza di tappeti di fiori che decorano le strade e rendono la città un luogo suggestivo.
Inoltre colori e profumi si mescolano nell'aria, nei parchi e viali che diventano veri e propri spettacoli. Le fiorite spesso sono composte da gruppi differenti che si ispirano da una bonaria rivalità fra loro e sono visitabili anche in alcuni parchi del capannorese.
Il Comune è famoso per le sue attività agricole e industriali. In particolare è nota per la produzione della carta, infatti Capannori è uno dei siti del distretto cartario di Lucca. Ha 1.340 abitanti.

Cohousing di Tassignano

Nel progetto "Abitare collaborativo", per recuperare e rivitalizzare piccoli borghi rurali e collinari e offrire risposte concrete alle esigenze di bisogno abitativo sul territorio per una determinata fascia di popolazione in stato di disagio, Fondazione Casa Lucca ha inaugurato sei alloggi per l'housing sociale dall'ex canonica di Tassignano. Le famiglie csono state selezionate a seguito di un avviso pubblico promosso dalla Fondazione Casa Lucca lo scorso aprile e i cui termini si sono chiusi a metà giugnoe hanno intrapreso un percorso di progettazione partecipata nella ideazione degli spazi comuni e dei servizi condivisi. I lavori di ristrutturazione sono iniziati nel 2018 e si sono conclusi nel novembre 2019. Il complesso immobiliare è su tre piani: piano terra: destinato a funzioni di socializzazione e e altri spazi comuni per i "condomini" tra cui anche l'area lavanderia; piano primo: destinato a tre alloggi; piano secondo e piano soffitta: destinato agli altri tre alloggi, sviluppati su due livelli; piano soffitta: parte della soffitta è stata destinata ad un uso comune. Sul retro c'è un ampio spazio verde come spazio comune per attività varie e un orto sociale. L'immobile è corredato da un ascensore per consentire agli occupanti un facile accesso. Il progetto di Tassignano si rivolge ai nuclei familiari monoparentali, giovani coppie, donne e uomini adulti singoli e over 65 singoli o in coppia.

Dati geografici:

Località: Tassignano
Stato: Italia
Regione: Toscana
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 225 m s.l.m.
Numero di abitanti: 1.340

Dettagli del progetto e obiettivi:

Area: Lucca
Periodo del progetto: 2018 - oggi
Investimento: 660mila euro
Obiettivi:

- Recupero e rivitalizzazione dei borghi rurali.
- Risposta alle esigenze abitative.
- Partecipazione e coinvolgimento della comunità.
- Recupero del patrimonio storico.
- Sostenibilità sociale e ambientale.
- Accessibilità e inclusione.
- Integrazione e supporto.

Tematiche affrontate:

- Cohousing per famiglie e over 65.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Terre Alte tra Confini e Frontiere

Il progetto "Terre Alte tra Confini e Frontiere" è stato promosso da Melius, impresa sociale, e dalla cooperativa Cramars, con il coinvolgimento dei giovani della Rete RIFAI. Le attività si sono svolte nei paesi di Pontebba, Timau, Topolò, Prossenico e Stolvizza nelle montagne friulane durante i mesi di luglio e settembre. Le "passeggiate generative" sono state aperte al pubblico e hanno avuto l'obiettivo di esplorare storie ed esperienze personali e comunitarie dei residenti. Il progetto si è focalizzato sul dialogo con gli abitanti di questi luoghi di confine, che hanno una lunga storia di interazione con Austria e Slovenia. I partecipanti, muniti di taccuino per annotare le loro impressioni, si sono trasformati in antropologi amatoriali, esplorando le montagne circostanti che hanno rappresentato un fertile terreno di idee ed energie. Più di 200 persone hanno preso parte al progetto, scoprendo la storia della Grande Guerra a Timau, le dinamiche economiche sociali a Prossenicco e il potere rigenerativo dell'arte a Topolò. I partecipanti hanno riflettuto su come poter promuovere l'attrattività e la vitalità futura di questi territori, influenzati dagli sguardi e dalle narrazioni degli abitanti locali, portando a casa una visione rinnovata delle montagne.

Dati geografici:

Località: Pontebba, Timau, Topolò, Prossenico e Stolvizza
Stato: Italia
Regione: Friuli Venezia Giulia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 800 m s.l.m.

Dettagli del progetto e obiettivi:

Numero di villaggi coinvolti: 5 villaggi;
Periodo del progetto: 2023
Obiettivi:

- Favorire il dialogo e l'interazione tra i residenti dei paesi delle montagne friulane promuovendo la conoscenza reciproca e la condivisione di storie ed esperienze di vita.
- Esplorare e documentare l'eredità storica e culturale, inclusa la memoria della Grande Guerra, le dinamiche delle economie sociali locali e l'influenza rigeneratrice dell'arte e della cultura.
- Stimolare la riflessione sulle potenzialità e le risorse dei paesi di montagna.
- Coinvolgere attivamente i partecipanti nel processo di esplorazione e di generazione di idee, incoraggiando un approccio partecipativo e inclusivo alla valorizzazione del patrimonio locale.
- Promuovere la conservazione e la valorizzazione del patrimonio culturale e ambientale delle Terre Alte.

Tematiche affrontate:

- Passeggiata alla ricerca di tracce culturali, beni comunali ed identità possibili per ricostruire un futuro.
- L'arte, la ricerca contemporanea, gli incontri per valorizzare il patrimonio storico-culturale.
- Passeggiate etnografiche nel borgo che conserva ancora le case di un tempo.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Val Bormida

La Val Bormida è un territorio che si trova cavallo tra l'Appennino e le Alpi Liguri, tra Liguria e Piemonte, rappresentando un vero e proprio crocevia tra queste regioni. Da un lato si affaccia verso il mare e dall'altro strizza l'occhio alle montagne. In poco più di 30 chilometri si può passare dalle rive del Mediterraneo alle colline della Langhe.
E' un territorio ricco di verde e di corsi e specchi d'acqua, di paesaggi unici e di panorami straordinari!
Da queste parti l'ambiente è dominato da dorsali verdi e boscose, che invitano ad amene escursioni a piedi, a cavallo o in mountain –bike, ed offrono il ristoro di fresche e salutari acque sorgive. Sul lago di Osiglia, in località Bardineto, è anche possibile praticare vela, windsurf e nuoto.
Un esame attento della costituzione geologica, e specialmente della orografia, ha fatto adottare la località di Bocchetta di Altare come termine delle Alpi e inizio dell'Appennino, perché qui si hanno la depressione orografica più pronunciata (450 metri) e la più decisa flessione degli assi riscontrabile in tutta la zona montana circostante.
Peculiarità che determinano una certa ricchezza di vegetazione.

Cose Piccole Che Stanno Per Esplodere

Carcare è uno di quei posti: un piccolo paese di cinquemila anime che dal recente passato ha ereditato gli esoscheletri di ruggine e calcestruzzo delle grandi fabbriche ormai senza vita, e dal presente il fumo nero e i forni roventi di ciò che è rimasto, a livello industriale, della lavorazione del carbone e del vetro. Non c'è più traccia del passato florido e da nessuna parte riecheggia più la prosa di Beppe Fenoglio che così bene ha descritto questi luoghi. In questa valle senza più coscienza del proprio antico passato e ormai depressa dalla crisi economica e dallo spopolamento senza fine iniziato negli anni Novanta è germogliato "Cose piccole che stanno per esplodere". Il piccolo collettivo composto da ragazze e ragazzi locali è nato in risposta all'assoluta assenza di un motore culturale incentrato sugli interessi e sulle aspirazioni delle giovani donne e uomini del territorio. Un ambizioso progetto che si pone come obiettivo la promozione e la valorizzazione di artiste locali attraverso la visibilità scaturita da eventi di piccole e medie dimensioni, in accordo con le disponibilità economiche e logistiche di cui lo stesso collettivo dispone. Le piccole cose che saranno presentate alla mostra sono un inno alla fragilità umana interpretata da una sensibilità tutta al femminile.

Dati geografici:

Località: Val Bormida
Stato: Italia
Regione: Liguria
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 585 m s.l.m.

Dettagli del progetto e obiettivi:

Area: Val Bormida;
Periodo del progetto: 2023

Gli obiettivi del progetto "Cose piccole che stanno per esplodere" a Carcare includono la promozione e la valorizzazione di artiste locali, focalizzandosi sulla visibilità ottenuta attraverso eventi di dimensioni contenute e medie. Nato in risposta alla mancanza di un motore culturale che rispecchiasse gli interessi e le aspirazioni dei giovani del territorio, il progetto mira a revitalizzare una comunità afflitta dalla crisi economica e dallo spopolamento. Utilizzando risorse economiche e logistiche a disposizione del collettivo, si propone di celebrare la fragilità umana attraverso una sensibilità artistica femminile, contribuendo così a riscoprire e valorizzare l'eredità culturale locale.

Tematiche affrontate:

- Promozione artisti locali.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

VAL DI SUSA - PIEMONTE

VAL DI SUSA

La Val di Susa (in occitano Val Susa, in arpitano Vâl Susa) è una valle alpina situata nella parte occidentale del Piemonte, ad ovest di Torino.
Ponte naturale verso l'Europa e teatro di importanti eventi storici, la Valle di Susa custodisce un immenso patrimonio di arte e cultura che, in aggiunta alle bellezze naturali delle montagne e dei boschi di fondovalle, rende straordinario e unico questo territorio. Una visita in Valle Susa non può che deliziare i sensi e soprattutto gusto e olfatto. Le comunità locali rendono infatti omaggio ogni anno ai propri prodotti con appuntamenti culinari, sagre e mostre mercato, offrendo l'occasione di degustare alcune di queste specialità e scoprire le piccole grandi bellezze di questa terra incastonata tra le montagne, a pochi chilometri da Torino. La tradizione culinaria locale è inevitabilmente legata alla posizione geografica e alla storia del territorio oltre che alle varie contaminazioni etnografiche. L'enogastronomia è quindi un aspetto originale attraverso cui scoprire questi luoghi ricchi di fascino: un immenso patrimonio di natura, arte e tradizioni gastronomiche. E' ai romani, ad esempio, che si deve lasistematica coltivazione della vite sui ripidi pendii valsusini, terreno ideale per la produzione di vini eccellenti quali l'Avanà, il Becquet e Carcairon, oltre che dei vitigni classici del Piemonte come il Dolcetto e il Barbera.
Abitanti: 90.000

Comunità energetica (CEVS)

Il progetto della Comunità Energetica della Valle Susa (CEVS) coinvolgerà la quasi totalità dei Comuni della valle, consentendo di massimizzare gli interventi di efficientamento energetico grazie a meccanismi condivisi di finanziamento. La prima fase sarà quella di coibentare gli edifici pubblici in classe alla classe NZEB. In seguito verranno realizzate micro reti di teleriscaldamento alimentate da un impianto a biomassa, locale e da filiere controllate, da 7 MW e impianti solari termici per ulteriori 5 MWt in grado di produrre 15 GWh/a di energia. Grazie a questi impianti, la comunità energetica sarà in grado di coprire il 100% dei fabbisogni energetici termici degli edifici pubblici coibentati e di alcuni edifici privati limitrofi. L'operazione di coibentazione sarà riservata anche agli edifici residenziali alimentati a biomassa che verranno sostituiti con generatori più efficienti, prevedendo risparmi fino al 50%, oltre alla riduzione del 90% delle emissioni di PM10, e il risparmio di 21.000 ton l'anno di legna. A queste azioni si aggiungerà un sistema di energy sharing di impianti fotovoltaici pubblici – 2 MW di potenza – già realizzati su una discarica e su edifici pubblici, con energia destinata all'autoconsumo degli Enti e all'alimentazione di veicoli elettrici a cui di aggiungeranno ulteriori 4 MW grazie alla partecipazione cittadina.

Dati geografici:

Località: Val Di Susa
Stato: Italia
Regione: Piemonte
Lingua: Italiano
Orario: Roma (CER)
Altitudine: da 300 a 3.612 m s.l.m.

Dettagli del progetto e obiettivi:

Area: Piemonte
Periodo del progetto: 2018 - oggi
Investimento: 660mila euro
Obiettivi:

- Massimizzazione dell'efficienza energetica.
- Sviluppo di infrastrutture energetiche locali.
- Utilizzo di energie rinnovabili.
- Riduzione delle emissioni e miglioramento dell'efficienza.
- Energy sharing tramite fotovoltaici.

Tematiche affrontate:

- Comunità energetica.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

Veneto

E' nata in Veneto, già dal 2018, la prima Comunità Energetica Agricola, grazie al progetto Energia Agricola a km0 promosso da Coldiretti Veneto e ForGreen SpA Società Benefit. Nasce come contributo del settore agricolo alla lotta ai cambiamenti climatici. Ha come finalità la crescita di una nuova cultura energetica che sensibilizzi le imprese agricole e i cittadini nella valorizzazione e utilizzo di energia verde prodotta localmente dalle imprese agricole. Persegue lo sviluppo di comunità energetiche traguardando l'attuazione delle direttine sul "mercato interno dell'energia elettrica" e "Red2" per coniugare i modelli di Comunità di cittadini e piccole imprese con le Comunità Rinnovabili. L'iniziativa, non è solo occasione per risparmiare sulla bolletta elettrica e condividere un'energia a km0, ma l'augurio a tutto il Paese che questa nostra grande forza di Comunità diventi di tutti. Si tratta infatti di un "patto sociale" in grado di offrire le migliori garanzie ai cittadini che hanno il diritto di essere protetti e di ricevere informazioni accurate sui prodotti che scelgono di acquistare, conoscendo, oltre al luogo di raccolta e trasformazione degli alimenti, l'origine degli ingredienti ed i metodi di produzione e lavorazione, anche le azioni di sostenibilità ambientali adottate dall'impresa agricola che produce i beni e della Comunità in cui opera.

Energia Agricola a Km "0"

La Coldiretti Veneto e la Società ForGreen SPA SB hanno avviato la prima comunità agro energetica 100% rinnovabile, in cui sono stati coinvolti 668 soci, tra utenti possessori di impianti ad energia rinnovabile, in grado di produrre e scambiare energia verde, consumatori dell'energia prodotta nel ciclo comunitario. In questo modello, in particolare, gli imprenditori agricoli in possesso dell'impianto di produzione assumono sia il ruolo di autoproduttori di energia da fonti rinnovabili, per soddisfare le proprie necessità, sia il ruolo di produttori attivi, o prosumer, producendo e cedendo a terzi il proprio surplus energetico verde. Grazie agli impianti installati nelle aziende degli utenti che aderiscono alla Comunità energetica, tutti **solari fotovoltaico**, sarà possibile produrre 1.811 MWh/a circa di energia elettrica, di cui usufruiranno anche gli 89 uffici centrali e periferici della Coldiretti Veneto. Un sistema energetico innovativo, in grado di risparmiare l'emissione in atmosfera di circa 2.178 tonnellate l'anno di CO_2 stimolando le imprese agricole ad utilizzare strumenti di green marketing, ed a promuovere al meglio l'impresa agricola, i prodotti agroalimentari e il territorio. Particolarità del progetto Energia agricola a km 0 è quello di spingere un modello di transizione energetica che mira a sviluppare una piattaforma basata su protocollo blockchain in grado di registrare in automatico gli scambi, con l'obiettivo di sviluppare una rete integrata.

Dati geografici:

Località: Veneto
Stato: Italia
Lingua: Italiano
Orario: Roma (CER)
Altitudine: 225 m s.l.m.

Dettagli del progetto e obiettivi:

Area: Piemonte
Periodo del progetto: 2018 - oggi
Investimento: Coldiretti Veneto e ForGreen
Obiettivi:

- Creazione della prima comunità agro energetica 100% rinnovabile.
- Ruolo di autoproduttori e produttori attivi (prosumer).
- Produzione di energia elettrica.
- Riduzione delle emissioni di CO2.
- Promozione del green marketing.
- Sviluppo di una piattaforma basata su blockchain.

Tematiche affrontate:

- Comunità energetica.

* Rete Rurale Nazionale. (n.d.). Rete Rurale Nazionale. https://www.reterifai.it/

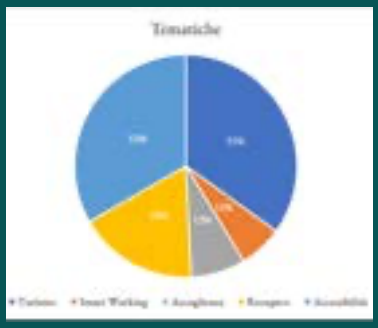
SOMMARIO ANALISI SMART VILLAGES ITALIANI

Mappa dei villaggi analizzati

Elenco dei villaggi europei analizzati e delle tematiche maggiormente trattate

SMART VILLAGES ITALIANI			
	Localizzazione	Smart Village	Tematica
1	Toscana	Santa Fiora	Smart working
2	Basilicata	Craco	Borgo fantasma e Accessibilità
3	Lazio	Civita di Bagnoregio	Turismo, promozione dell'accessibilità, filmografia
4	Puglia	Alberobello	Turismo e recupero, commercio e sviluppo del territorio
5	Sardegna	Alghero	Smart mobility, valorizzazione dei beni culturali, benessere sociale e protezione dell'ambiente
6	Sicilia	Erice	Digitalizzazione, accessibilità e recupero, fruizione turistica
7	Liguria	Sestri Levante	Smart mobility, valorizzazione dei beni culturali, benessere sociale e protezione dell'ambiente
8	Lombardia	Concorezzo	Smart mobility, valorizzazione dei beni culturali, benessere sociale e protezione dell'ambiente
9	Basilicata	Laurenzana	Recupero edifici in disuso
10	Puglia	Bari	Cohousing
11	Sardegna	Botrugno	Conoscenza del territorio
12	Lombardia	Concorezzo	Borgo del Futuro - Smart - Mobilità, Ambiente, Benessere e Beni culturali
13	Friuli Venezia Giulia	Pontebba, Timau, Toloò, Prossenico e Stolvizza	Promozione della natura, arte e cultura
14	Puglia	Gargano	Passeggiate naturalistiche
15	Liguria	Val Bormida	Promozione artisti locali
16	Lombardia	Cevo	Centro culturale di montagna
17	Emilia Romagna	Dozza	Street arte e murales
18	Campania	Apice Vecchia	Museo a cielo aperto e Borgo fantasma
19	Toscana	Tassignano	Cohousing
20	Piemonte	Pinerolo	Comunità energetica
21	Piemonte	Val di Susa	Comunità energetica
22	Veneto	Aziende agricole a KM 0	Comunità energetica
23	Lombardia	Adamello	Rigenerazione territoriale, valorizzazione delle risorse locali, processi di sviluppo locale
24	Friuli Venezia Giulia	-	Percorsi naturalistici alla scoperta dei piccoli paesi dell'entroterra
25	Lombardia	Airuno	Animazione sociale e cooperative
26	Sardegna	Nuoro	Smart working
27	Basilicata	Pietragalla	Enoturismo
28	Lazio	Monteverde	Accessibilità
29	Basilicata	Scanzano Jonico	Turismo cinematografico
30	Basilicata	Montalbano Jonico	Accoglienza immigrati
31	Piemonte	Bardonecchia	Borgo del Futuro - Smart - Mobilità, Ambiente, Benessere e Beni culturali
32	Sardegna	Carbonia	
33	Calabria	Cetraro	
34	Puglia	Ginosa	
35	Sardegna	Otranto	
36	Marche	Grottammare	
37	Sicilia	Pantelleria	
38	Abruzzo	Laturo	Turismo rurale
39	Reggio Calabria	Pentedattilo	Borgo fantasma
40	Lazio	Celleno	Borgo fantasma
41	Sicilia	Erice	Percorsi per ipovedenti e ciechi

Statistica delle tematiche maggiormente trattate



Il grafico illustra chiaramente come le strategie adottate dai Smart Villages italiani si distribuiscano tra quattro principali categorie, evidenziando il primato del turismo sostenibile e del recupero culturale (40%), seguito dalla smart mobility (25%), digitalizzazione (20%) e, infine, comunità energetiche (15%). È evidente che il focus sulla valorizzazione del patrimonio storico e culturale costituisce il pilastro centrale di molte iniziative, probabilmente perché rappresenta il motore principale dello sviluppo economico di queste aree. Tuttavia, la crescente attenzione verso la smart mobility e la protezione ambientale indica che vi è una forte consapevolezza dell'importanza di migliorare la qualità della vita dei residenti attraverso soluzioni tecnologiche sostenibili, come veicoli elettrici e percorsi ciclabili. Il dato del 25% suggerisce che molti villaggi stanno rapidamente integrando queste strategie per ridurre l'impatto ambientale e incentivare una mobilità più sostenibile.

Interessante anche la percentuale attribuita alla digitalizzazione e accessibilità (20%), la quale sottolinea un trend di innovazione digitale che va di pari passo con il miglioramento dell'inclusione e l'accesso ai servizi. Questo dato potrebbe crescere ulteriormente nei prossimi anni, con l'espansione delle infrastrutture tecnologiche.

Infine, le comunità energetiche, sebbene rappresentino una percentuale minore (15%), mostrano un approccio lungimirante, con l'intento di creare modelli autosufficienti basati su fonti rinnovabili. Queste iniziative, anche se ancora relativamente ridotte, potrebbero diventare una componente sempre più rilevante nelle strategie di sostenibilità ambientale nel lungo termine

ATLANTE
delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie

Luisa Lombardo

ALLEGATO 2

Università degli Studi di Palermo
DIPARTIMENTO DI ARCHITETTURA UNIPA
DOTTORATO DI RICERCA IN ARCHITETTURA ARTI E PIANIFICAZIONE

Dottorato in Architettura, Arti e Pianificazione
Dipartimento di Architettura DARCH
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architettura Tecnica

CENTRI MINORI INTELLIGENTI
NEL PARCO DELLE MADONIE IN SICILIA

STRATEGIE DI RECUPERO E VALORIZZAZIONE DELLE AREE INTERNE

ALLEGATO 2

ATLANTE
delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie

IL DOTTORE
Ing. Luisa Lombardo

IL COORDINATORE
Prof. Arch. Marco Rosario Nobile

IL TUTOR
Prof. Ing. Ph.D. Tiziana Campisi

Il Tutor della SopriPa:
Arch. Delia Geraci

IL CO-TUTOR
Prof. Arch. Ph.D. Simona Colajanni

Il Tutor (R+):
Prof. Arturo Zaragozá Catalán
Co-Tutor (UPV):
Prof. Rafael Marín Sánchez

CICLIO XXXVII
ANNO CONSEGUIMENTO TITOLO 2025

Luisa Lombardo

ATLANTE

delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie

In copertina:
La rete di Smart Villages del Parco delle Madonie, Palermo (PA); ©Luisa Lombardo, 2022

Università degli Studi di Palermo

DIPARTIMENTO DI ARCHITETTURA UNIPA

DOTTORATO DI RICERCA IN ARCHITETTURA ARTI E PIANIFICAZIONE

Ph.D. in Architecture, Arts, and Planning
Department of Architecture (DARCH)
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architectural Engineering

SMART VILLAGES
IN THE MADONIE PARK IN SICILY

STRATEGIES FOR THE REHABILITATION AND ENHANCEMENT OF INNER AREAS

ANNEX 2

ATLAS
technological solutions for the rehabilitation and enhancement of the inner areas of the Madonie Park

THE DOCTOR
Eng. Luisa Lombardo

THE COORDINATOR
Prof. Arch. Marco Rosario Nobile

THE SUPERVISOR
Prof. Eng. Ph.D. Tiziana Campisi

SopriPa Supervisor
Arch. Delia Geraci

THE CO-SUPERVISOR
Prof. Arch. Ph.D. Simona Colajanni

(R+) Supervisor
Prof. Arturo Zaragozá Catalán
(UPV) Co-Supervisor
Prof. Rafael Marín Sánchez

CYCLE XXXVII
YEAR OF DEGREE AWARD 2025

ATLANTE
delle soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie

Autore

Luisa Lombardo
PhD Student Dipartimento di Architettura, Università degli Studi di Palermo

Coordinamento Scientifico

UNIPA

Tiziana Campisi
Professore Ordinario, Dipartimento di Architettura, Università degli Studi di Palermo

SOPRINTENDENZA AI BENI CULTURALI E AMBIENTALI DELLA PROVINCIA DI PALERMO

Delia Geraci
Architetto, U.O. 02 - Sezione per i Beni architettonici e storico-artistici, paesaggistici e demoetnoantropologici

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INTRODUZIONE

Il presente volume, intitolato "*Atlante. Soluzioni tecnologiche per il recupero e la valorizzazione delle aree interne del Parco delle Madonie*" è stato realizzato con l'obiettivo di riorganizzare e armonizzare le ricerche precedenti esistenti e creare un documento strategico specifico per il territorio del Parco delle Madonie, in Sicilia, con i suoi 21 comuni definiti aree interne secondo la SNAI - Strategia Nazionale per le Aree Interne. Costituisce un vademecum completo sui criteri di recupero dell'architettura rurale e del patrimonio naturale e paesaggistico, in sintonia con le Linee Guida[1] dell'United Nations Educational, Scientific and Cultural Organization - UNESCO.

Preservare un'area eterogenea e peculiare come quella del Parco delle Madonie, rinomata per la varietà e unicità del suo paesaggio, significa tutelare le tracce storiche, architettoniche, ambientali, artistiche e culturali che hanno contribuito nel corso dei secoli a forgiare un'identità culturale comune. Questa ricchezza è unica sia per gli abitanti del luogo che per i visitatori, offrendo scorci e esperienze imperdibili da vivere.

Consapevole che il rispetto del paesaggio deriva da una presa di coscienza promossa da un positivo atteggiamento culturale, e non da divieti imposti, si è scelto di privilegiare, con questo volume, un indirizzo guida. Ciò si è concretizzato attraverso la catalogazione degli interventi possibili, sostenibili e compatibili in categorie "consigliate" e "da valutare caso per caso," intendendo per "consigliate" quelle azioni che si mostrano coerenti con gli obiettivi di conservazione dei tratti tradizionali, ai quali viene attribuito un valore culturale.

Nel loro insieme, le indicazioni fornite dall'Atlante costituiscono buone prassi, linee guida, consigli e suggerimenti per la gestione e il recupero e la valorizzazione, sia dal punto di vista paesaggistico che architettonico. Si ritiene che questo approccio possa guidare gli interessati, ovvero cittadini, amministrazioni, imprese, tecnici e tutti i soggetti coinvolti nella gestione dei territori verso l'adozione di modelli virtuosi di comportamento utili a sviluppare processi di innovazione coniugando la tradizione.

Si auspica che che numerosi Comuni madoniti possano beneficiare di questo strumento a supporto degli operatori, per una rinnovata crescita progettuale, tecnica e culturale, soprattutto in un momento di forte sviluppo territoriale come quello attuale. Questo costituirà un concreto aiuto per riconoscere e incoraggiare le "buone prassi" legate alla tutela del paesaggio, alla sostenibilità ambientale, alla riqualificazione energetica, all'adeguamento sismico, all'accessibilità e alla governance. Queste sfide devono essere affrontate come opportunità e non come limitazioni, mantenendo sempre un equilibrio tra conservazione e innovazione.

Sebbene il contesto economico, sociale e culturale possa variare, la volontà di preservare l'immenso e unico patrimonio del Parco delle Madonie rimane immutata.

Lo stesso vale per altri ambiti territoriali che, per analogia o contrasto, intendono intraprendere un simile percorso di rinascita.

Luisa Lombardo
Dipartimento di Architettura
Università degli Studi di Palermo

[1]Legge 20 febbraio 2006, n. 77. (2006). Misure speciali di tutela e fruizione dei siti e degli elementi italiani di interesse culturale, paesaggistico e ambientale, inseriti nella "lista del patrimonio mondiale", posti sotto la tutela dell'UNESCO. Rendicontazione dei progetti finanziati. Linee guida.

Fotografia
Il materiale fotografico è stato prodotto dalla dottoranda Ing. Luisa Lombardo ed integrato con le immagini fornite:
- dai fotografi: Giovanni Di Lorenzo, Salvatore Fiume, Deborah Rosiello, Carmelo Di Salvo e da altri madoniti innamorati della propria terra.
Particolare menzione va fatta per il Gruppo Facebook "Quelli del Parco delle Madonie" che, giornalmente, ribadisce il profondo amore per una terra così ricca di risorse e colma di punti di vista sempre più affascinanti.
Se eventuali ulteriori autori delle fotografie riscontrassero la presenza di loro immagini sono pregati di contattare l'Ing. Luisa Lombardo.

Testi
I testi consultati per la stesura del presente volume sono consultabili alla fine dell'elaborato; alcune informazioni, dettagli e approfondimenti sono tratti da Ricerche precedenti effettuate nell'area oggetto di studio, così come da altri atlanti presenti in letteratura scientifica.

LINEE DI INDIRIZZO

Osservatorio ad Isnello nel Parco delle Madonie; ©Carmelo Di Salvo, 2022

Piano Farina; ©Luisa Lombardo, 2023

2.1 - FINALITÀ E CRITERI

Le presenti Linee di Indirizzo forniscono precise indicazioni per la valutazione, fruizione e valorizzazione, nonché per il miglioramento del patrimonio culturale tutelato nell'Area del Geopark UNESCO delle Madonie, facendo riferimento alle normative italiane e siciliane concernenti la tutela e la valorizzazione dei beni architettonici.

Le linee guida proposte forniscono orientamenti operativi alle amministrazioni locali, ai progettisti, agli esperti tecnici e al personale della Soprintendenza per i Beni Culturali e Ambientali della Provincia di Palermo, e cittadini. L'obiettivo è offrire uno strumento utile per individuare soluzioni tecnologiche compatibili con le strutture esistenti, ovvero l'architettura tradizionale e il paesaggio, fornendo un supporto concreto nella scelta delle tecnologie da applicare al patrimonio materiale e immateriale, in conformità con i nuovi incentivi in materia di efficienza energetica, adeguamento sismico e valutazione delle prestazioni energetiche e tecnologiche degli edifici storici.

Inoltre, le linee guida considerano il comprensorio madonita come un insieme di villaggi che possono collaborare per raggiungere la qualifica di *Smart Villages*, villaggi che sfruttano la tecnologia per migliorare le condizioni di vita. Strumenti che costituiscono uno strumento scientifico rigoroso e tecnicamente aggiornato su questa materia, permettendo a tutti di interagire in modo consapevole e autonomo con i progettisti e i richiedenti, anche nel campo dell'efficienza energetica. Un ulteriore obiettivo è quello di offrire agli organi preposti alla tutela del patrimonio culturale criteri e metodi per una valutazione critica e completa sia dei progetti presentati per ottenere le autorizzazioni di legge, sia di quelli preparati all'Ufficio di competenza. Questo al fine di considerare adeguatamente gli aspetti legati alle prestazioni energetiche degli edifici soggetti a tutela e di snellire le pratiche burocratiche senza problemi o intoppi dovuti ad interventi non ammissibili nell'area di riferimento.

Il documento elaborato non fornisce soluzioni standardizzate né impone metodi vincolanti, tenendo conto delle peculiarità dei beni coinvolti, dell'evoluzione naturale delle tecnologie nel tempo e delle future revisioni normative. Tuttavia, esso può fungere da guida per la formazione di un *expertise* e la sensibilità del personale coinvolto e dei progettisti, con l'obiettivo primario di proteggere e conservare il patrimonio culturale in un'ottica di compatibilità e sostenibilità. Durante la redazione del testo, sono state considerate numerose fonti, tra cui volumi sul patrimonio rurale del territorio italiano e, in particolare, delle aree rurali interne ospitanti parchi nazionali, come riportato in bibliografia a fine volume.

Se per altri ambiti italiani la costituzione di un atlante, supportato da strumenti tecnici come linee guida applicate a un caso studio, può risultare ridondante, per la Sicilia rappresenta, invece, uno strumento ancora poco diffuso fatto salvo per alcuni comuni virtuosi e di piani regolatori e regolamenti tecnici completi secondo l'attuale normativa vigente. Inoltre, questo volume affronta innumerevoli criteri smart per la valorizzazione del territorio, promuovendo una sinergia tra tradizione e innovazione, e mira a raccogliere le migliori pratiche adottate a livello globale per applicarle nel contesto del Parco delle Madonie.

2.2 - QUADRO DELLE PRINCIPALI DISPOSIZIONI NORMATIVE

L'area del Parco delle Madonie, situata in Sicilia e coprente circa 40.000 ettari di territorio verde, è stata inserita nel Patrimonio UNESCO nel 2004.

È stata designata come area protetta ai sensi del Decreto Legislativo del 22 gennaio 2004, n. 42, noto come Codice dei Beni Culturali e del Paesaggio, che regola la tutela dei beni culturali e paesaggistici in Italia.

Attualmente, il nuovo Piano Paesaggistico dell'area del Comune di Palermo è in fase di pubblicazione, in attesa degli ultimi aggiornamenti.

Fino ad allora, restano valide le disposizioni del Piano precedente, applicabili a tutta la regione siciliana, salvo i Comuni che hanno già adottato il nuovo Piano. Questo strumento identifica i beni di interesse paesaggistico e regolamenta gli interventi che possono essere effettuati nell'area.

Con il Decreto del Presidente della Repubblica (D.P.R.) del 13 febbraio 2017, n. 31, sono stati individuati gli interventi ammissibili o non ammissibili, con la presentazione di una serie di documenti necessari a descrivere le modifiche possibili, seguendo un iter semplificato o meno. Per interventi su edifici o aree protette dal punto di vista paesaggistico, i proprietari, possessori o detentori devono ottenere l'autorizzazione paesaggistica oltre al titolo edilizio richiesto per la tipologia di intervento.

Dal 2017, alcuni interventi "di lieve entità" sono soggetti a un'autorizzazione paesaggistica semplificata. Di seguito, una dettagliata disamina degli interventi possibili e delle modalità operative.

Interventi non soggetti ad autorizzazione paesaggistica

L'autorizzazione paesaggistica non è necessaria nei seguenti casi, come previsto dall'articolo 149:

- interventi di manutenzione ordinaria, straordinaria, di consolidamento statico e restauro conservativo, a condizione che non alterino lo stato dei luoghi e l'aspetto esteriore degli edifici;
- interventi legati all'attività agro-silvo-pastorale, purché non comportino un'alterazione permanente dello stato dei luoghi con costruzioni edilizie o altre opere civili, e non modifichino l'assetto idrogeologico del territorio;
- operazioni di taglio colturale, forestazione, riforestazione, bonifica, antincendio e conservazione all'interno dei boschi e delle foreste soggetti a tutela, se previsti e autorizzati in conformità con la normativa in materia.

Autorizzazione paesaggistica "ordinaria"

Il richiedente presenta all'autorità competente un'istanza, corredata dalla documentazione progettuale e dalla relazione paesaggistica, redatta da un tecnico abilitato in conformità con il Decreto del Presidente della Repubblica del 12 dicembre 2005.

L'amministrazione esamina l'istanza e la documentazione, verificando la completezza degli elementi forniti e richiedendo, se necessario, integrazioni. Entro 40 giorni dalla ricezione, l'amministrazione trasmette tutto alla Soprintendenza, allegando una relazione tecnica esplicativa e una proposta di provvedimento.

Il Soprintendente emette un parere vincolante entro 45 giorni dalla ricezione della documentazione. In caso di parere negativo, comunica il preavviso di provvedimento negativo agli interessati. Entro 20 giorni dalla ricezione del parere, l'amministrazione adotta le misure opportune in conformità con il parere stesso. L'autorizzazione paesaggistica ha validità di 5 anni e, in caso di diniego, è possibile presentare ricorso al tribunale amministrativo regionale o ricorso straordinario al Presidente della Repubblica entro i termini di legge. In caso di inerzia delle amministrazioni coinvolte, la legge prevede misure sostitutive (articolo 146, commi 9 e 10).

Autorizzazione paesaggistica semplificata

Gli interventi di lieve entità su aree o immobili tutelati dal Codice dei Beni Culturali e del Paesaggio (D.L. 22 gennaio 2004, n. 42) sono soggetti a un procedimento semplificato di autorizzazione paesaggistica, ai sensi dell'articolo 146, comma 9. Questi interventi comportano un'alterazione dei luoghi o dell'aspetto esteriore degli edifici elencati nell'allegato 1 del DPR 139 del 2010.

Il richiedente deve presentare un'istanza corredata dalla relazione paesaggistica semplificata, redatta da un tecnico abilitato, seguendo le indicazioni del Decreto del Presidente del Consiglio dei Ministri del 12 dicembre 2005. La relazione deve attestare anche la conformità del progetto alla disciplina urbanistica ed edilizia. Se l'autorità competente per l'autorizzazione non coincide con quella urbanistica ed edilizia, è necessario ottenere dal comune un'attestazione di conformità dell'intervento alle prescrizioni urbanistiche ed edilizie.

La domanda e i documenti allegati possono essere presentati telematicamente. Se l'intervento riguarda lo sportello unico per le autorità produttive, la domanda può essere presentata a quest'ultimo. L'amministrazione esamina la richiesta e la relazio-

Chiesa Madonna di Loreto a Petralia Soprana; ©Sicilia du me cori, 2023

ne paesaggistica, inviando la documentazione alla Soprintendenza entro 30 giorni. Il Soprintendente emette un parere vincolante entro 25 giorni dalla ricezione. Se il parere è negativo, informa immediatamente l'interessato. Se positivo, comunica l'esito all'amministrazione, che notifica il risultato al richiedente entro 5 giorni e rilascia contemporaneamente il titolo edilizio.

L'autorizzazione è immediatamente efficace e valida per 5 anni. Trascorso questo periodo, è necessaria una nuova autorizzazione. In caso di inerzia delle amministrazioni coinvolte, la legge prevede misure sostitutive (articolo 4 del DPR 139/10). Inoltre, la documentazione deve rispettare anche le prescrizioni dei Regolamenti edilizi dei Comuni delle Madonie.

L'autorizzazione paesaggistica serve, dunque, per realizzare opere quali la costruzione di edifici, di nuove infrastrutture, o per recuperare il patrimonio esistente. Lo scopo è quello di autorizzare e regolamentare la realizzazione di opere che potrebbero avere un impatto significativo sul paesaggio o su un contesto tutelato.

Per questo motivo, risulta necessaria la definizione di un Ente incaricato della valutazione delle richieste e dalla successiva concessione.

Ogni richiesta viene analizzata in modo specifico, in considerazione della tipologia di intervento che si vuole realizzare e della documentazione allegata. Infatti, è necessario valutare la compatibilità dell'intervento con l'ambiente e i valori culturali e storici del luogo. I criteri da utilizzare sono, appunto, la tutela dell'ambiente naturale e culturale o anche l'armonia con il contesto esistente.

CONOSCENZA DEL CONTESTO MADONITA

Vista da Pizzo Carbonara; ©Luisa Lombardo, 2023

3.1 - I BENI ARCHITETTONICI IN RIFERIMENTO AL CODICE DEI BENI CULTURALI E DEL PAESAGGIO

Il termine "beni architettonici", evoluzione del concetto di "monumento"[1], si riferisce a tutti quei manufatti immobili sottoposti a tutela secondo la normativa vigente sui beni culturali.

In conformità all'art. 9 della Costituzione, dal 1 maggio 2004 la normativa italiana è rappresentata dal Codice dei beni culturali e del paesaggio (decreto legislativo 22 gennaio 2004, n. 42 e successive modifiche e integrazioni, di seguito citato come "Codice"), soggetto a due significativi aggiornamenti nel 2006 e nel 2008 e occasionalmente modificato tramite articoli sparsi in leggi o decreti-legge convertiti.

Il suddetto testo normativo, articolato in cinque parti e costituito da un totale di 184 articoli, più due allegati (A e B), non si limita a una semplice fusione ed organizzazione sistematica delle precedenti leggi in materia, ma introduce anche significative novità, affrontando e regolamentando in maniera dettagliata diverse fattispecie mai trattate in precedenza, come ad esempio la valorizzazione, soprattutto a seguito delle modifiche introdotte nel 2001 al Titolo V della Costituzione.

I beni architettonici rientrano nel più ampio ambito dei beni culturali, e il Codice, dopo aver definito all'art. 2, comma 1, il patrimonio culturale come l'insieme dei beni culturali e dei beni paesaggistici, al comma seguente definisce i primi, rimandando ai successivi articoli 10 e 11 per una loro puntuale identificazione.

Seguendo il dettato dell'articolo 10 citato, possiamo pertanto iniziare a definire un primo gruppo di beni architettonici, di proprietà pubblica, come le cose immobili appartenenti allo Stato, alle regioni, agli altri enti pubblici territoriali, a ogni altro ente e istituto pubblico e a persone giuridiche private senza fine di lucro, compresi gli enti ecclesiastici civilmente riconosciuti, che presentano interesse artistico e storico. La culturalità potenziale delle suddette cose immobili è tuttavia subordinata ai seguenti requisiti essenziali: la scomparsa dell'autore e un'esecuzione risalente a oltre settanta anni.

Questo primo gruppo di beni architettonici, avente i requisiti essenziali sopra delineati, è in via provvisoria sottoposto a tutela fino alla conclusione, d'ufficio o su richiesta dei soggetti cui appartengono, della verifica dell'interesse artistico o storico. L'esito della verifica, che deve concludersi entro 120 giorni dal ricevimento della richiesta, o dalla ricezione della comunicazione di avvio del procedimento in caso di avvio d'ufficio, può essere:

- positivo, con i beni architettonici che restano definitivamente sottoposti a tutela;
- negativo, con i beni immobili che non sono sottoposti a tutela e liberamente alienabili, previa sdemanializzazione se appartengono al Demanio dello Stato, delle regioni e degli altri enti pubblici territoriali, qualora non vi siano altre ragioni di interesse pubblico.

Il Ministero ha regolamentato puntualmente tutte le modalità per l'esecuzione della verifica d'interesse culturale attraverso una serie di decreti (alcuni dei quali emanati in concerto con altri soggetti pubblici, quali l'Agenzia del Demanio e il Ministero della Difesa), che specificano nel dettaglio tutti i passaggi necessari. È stato altresì predisposto un sistema informativo denominato "Beni tutelati", che consente, previa rilascio di credenziali di accesso agli Enti richiedenti da parte dei competenti organi periferici del Ministero, di informatizzare l'intero procedimento di verifica.

In caso di esito positivo della verifica, l'atto finale è un decreto che, sulla base dell'istruttoria tecnica compiuta dalla Soprintendenza competente, dichiara l'interesse storico-artistico del bene architettonico. Il decreto è notificato al proprietario, possessore e detentore del bene architettonico, e trascritto presso i servizi di pubblicità immobiliare.

Un secondo gruppo di beni architettonici, non di proprietà pubblica, è costituito dalle cose immobili che presentano interesse artistico e storico particolarmente importante. In tal caso, la culturalità del bene è sottoposta ai seguenti requisiti essenziali: la scomparsa dell'autore, un'esecuzione risalente a oltre cinquant'anni, e un provvedimento di dichiarazione dell'interesse culturale notificato al proprietario, possessore o detentore.

La dichiarazione dell'interesse culturale, simile alla verifica, è un decreto che segue un'istruttoria compiuta dalla Soprintendenza competente e che avvia il procedimento. Anch'essa è trascritta presso i servizi di pubblicità immobiliare, con un termine di conclusione del procedimento pari a 120 giorni.

Un terzo gruppo di beni architettonici previsto dal Codice prescinde dall'appartenenza pubblica o privata degli immobili, dalla morte dell'autore e dal periodo di esecuzione degli stessi, e presenta come unico requisito essenziale l'emanazione di un decreto di dichiarazione di interesse particolarmente importante per il loro riferimento con la storia politica, militare, della letteratura, dell'arte, della scienza, della tecnica, dell'industria e della cultura in generale, o quali testimonianze dell'identità e della storia delle istituzioni pubbliche, collettive o

[1] dal latino "monere", che significa ammonire, avvisare, far ricordare, avvertire, informare, ricordare

religiose. In tal modo è possibile includere tra i beni architettonici anche edifici di architettura contemporanea. I beni architettonici appartenenti a questo terzo gruppo sono inalienabili se appartenenti a Enti titolari di demanio.

A seconda della proprietà, possono rientrare tra il primo e il secondo gruppo di beni architettonici:

- ville, parchi e giardini di interesse artistico o storico;
- pubbliche piazze, vie, strade e altri spazi urbani di interesse artistico o storico;
- architetture rurali.

Tra gli immobili oggetto di specifiche disposizioni di tutela si ricordano anche gli studi d'artista, per i quali il Codice prevede il divieto di modifica della destinazione d'uso, anche per la tipologia tradizionale a lucernario, se adibiti a tale uso da almeno venti anni.

Costituisce infine un quarto gruppo di beni architettonici, tutti quei manufatti immobili sottoposti a tutela sulla base delle leggi previgenti al Codice, e come tali oggetto in passato di apposite notifiche e dichiarazioni di cui il Codice ribadisce l'efficacia. Rientrano in tale quarto gruppo anche beni architettonici situati in città o parti di esse, complessi architettonici e monumenti nazionali, oggetto di specifiche leggi.

La sottoposizione a un regime di tutela di un edificio, e quindi la sua classificazione come "bene architettonico", comporta alcuni precisi obblighi conservativi, tra cui:

- i beni non possono essere distrutti, deteriorati, danneggiati o adibiti a usi non compatibili con il loro carattere storico o artistico, o tali da pregiudicarne la conservazione.
- l'esecuzione di opere e lavori di qualunque genere deve essere preventivamente autorizzata dalla Soprintendenza Belle Arti e Paesaggio, o dalla Commissione regionale per il patrimonio culturale in caso di interventi di demolizione o rimozione definitiva (salvo casi di urgenza per i quali l'autorizzazione può essere rilasciata dal Soprintendente competente con contestuale informazione al Segretario regionale), o dal Segretario regionale in caso di compresenza di competenze di più Soprintendenze di settore.

L'autorizzazione relativa a interventi in materia di edilizia pubblica e privata (esclusi i casi della conferenza di servizi e della valutazione di impatto ambientale - VIA) è rilasciata entro 120 giorni dalla ricezione della richiesta, salvo eventuali sospensioni per richieste di chiarimenti, elementi integrativi o accertamenti di natura tecnica; per questi ultimi tuttavia il periodo di sospensione non può superare i 30 giorni.

La specificità dei beni architettonici è ribadita dal fatto che gli interventi proposti, siano essi di manutenzione o di restauro, devono mirare al mantenimento dell'integrità, dell'efficienza funzionale e dell'identità del bene e delle sue parti, e garantire comunque la trasmissione alle future generazioni dei suoi valori culturali.

Tale principio ineludibile è ribadito anche dal Codice con riferimento agli aspetti strutturali del restauro, che devono puntare al miglioramento strutturale, anziché all'adeguamento tout court alle normative tecniche per le costruzioni, e deve essere ancor più evidenziato e rafforzato per gli eventuali interventi di adeguamento impiantistico.

Si deve notare che l'esecuzione di lavori o opere di qualunque genere su beni architettonici, come sopra definiti, senza autorizzazione comporta, oltre alle sanzioni previste dalla vigente normativa urbanistica, l'applicazione di sanzioni amministrative da parte del Ministero (di rimessione in pristino o pecuniarie) e penali da parte dell'Autorità giudiziaria. Sono previste sanzioni penali anche per chiunque destini un bene architettonico a un uso incompatibile con il suo carattere storico-artistico, o tale da pregiudicarne la conservazione o l'integrità.

A ulteriore chiarimento delle tematiche trattate nel presente paragrafo, si ritiene utile allegare anche un sintetico schema grafico esplicativo (*Fig. 1*).

Scorcio Madonita ©Luisa Lombardo, 2022

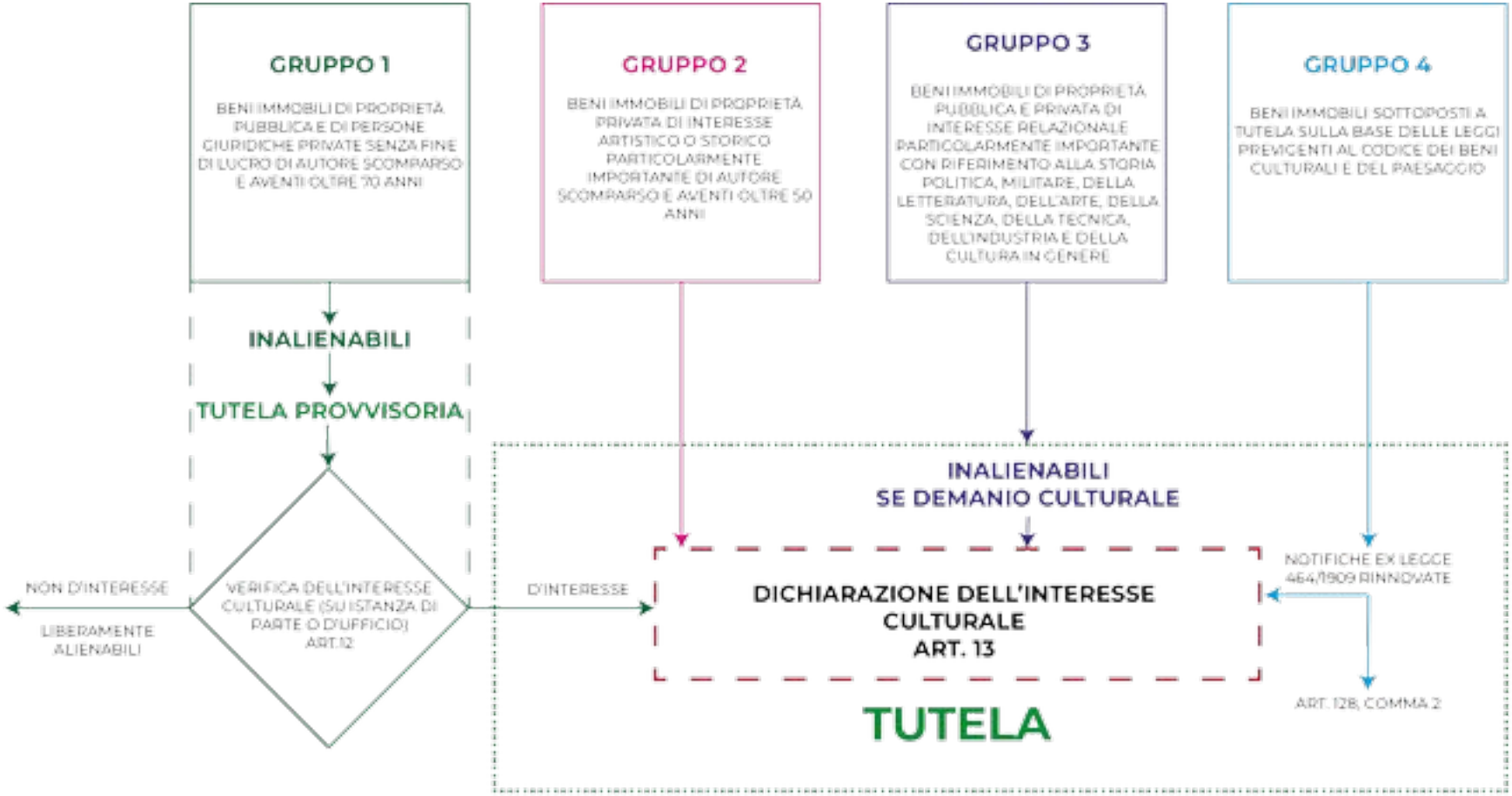


Fig. 1 | Schema del vigente regime di tutela dei beni architettonici sulla base del Codice dei beni culturali e del paesaggio. ©Luisa Lombardo, 2023

3.2 - I CENTRI MINORI DEL PARCO DELLE MADONIE

Le Madonie, note anche come *Madonìa* (in siciliano *Li Marunìi*), sono una dorsale montuosa situata nella parte centro-settentrionale della Sicilia, interamente compresa nella città metropolitana di Palermo (*Fig. 2*).

Questo complesso montuoso, tutelato ai sensi del Decreto Legislativo n. 42 del 22 gennaio 2024, si estende a ovest dei Monti Nebrodi e dei Monti Peloritani, che appartengono alla città metropolitana di Messina. Insieme, questi tre gruppi montuosi costituiscono l'Appennino Siculo. Nella parte centrale delle Madonie si trova un altopiano carsico che ospita le vette più elevate della Sicilia dopo l'Etna.

Le Madonie rivestono un'importanza fondamentale per l'approvvigionamento idrico di Palermo e della sua area metropolitana, grazie alla presenza di numerose sorgenti, alcune delle quali con una portata media di circa 800 litri al secondo. Un esempio significativo è la sorgente di Scillato, sfruttata dall'omonimo acquedotto. Dal 2015, le Madonie sono state incluse nella lista globale dei geoparchi dell'UNESCO (*Fig. 3c*), diventando un sito patrimonio mondiale.

Nell'antichità, il complesso montuoso era noto come Maroneum. Plinio il Vecchio menziona questo toponimo descrivendo il fragore dei boati del vulcano Etna udito da zone remote: "*Fragor vero ad Maroneum et Gemellos Colles*". Successivamente, il toponimo fu associato al feudo di Madonìa, di proprietà dei marchesi Crescimanni. Questo feudo era una delle baronie di Aspromonte, che si estendeva su parte del territorio della famiglia La Farina, una famiglia nobile di Palermo.

Le Madonie sono comprese nel Parco delle Madonie e si estendono tra le valli dei fiumi Imera Settentrionale a ovest e Pollina a est, separandosi dai Monti Nebrodi. A sud, le Madonie scendono bruscamente fino al confine con il Libero Consorzio di Caltanissetta, mentre a nord si affacciano sul Mar Tirreno.

La vetta più alta delle Madonie è Pizzo Carbonara (1979 m s.l.m.), la seconda in Sicilia dopo l'Etna; altre cime significative[1] risultano sparse in tutto il territorio circostante.

Dal punto di vista geologico, la formazione delle Madonie si è verificata negli ultimi 20 milioni di anni, dal Miocene al Pleistocene, con sovrapposizioni di unità bacinali carbonatiche e carbonatico-silicoclastiche, derivanti dalla deformazione del dominio Imerese, e di unità calcareo-dolomitiche di piattaforma carbonatica, derivanti dalla deformazione della piattaforma Panormide. Nella zona centrale del gruppo montuoso, ad altezze superiori ai 1600 m, si trova una vasta area carsica, con doline (Piano Battaglia, la Battaglietta e la Valle della Conserva), inghiottitoi e grotte (tra cui l'Abisso del Vento, l'Inghiottitoio della Battaglietta, la Grotta delle Zanzare, la Grotta del Canalone, il Pozzo di Minnonica). Il torrente Castelbuono, precedentemente noto come Vallone Madonie, attraversa le Madonie dividendo le zone meridionali da quelle nord-occidentali.

Il territorio delle Madonie comprende ventuno comuni come in elenco:

- Alimena;
- Blufi;
- Bompietro;
- Castellana Sicula;
- Gangi;
- Geraci Siculo;
- Petralia Soprana;
- Petralia Sottana;
- Polizzi Generosa;
- Castelbuono;
- Collesano;
- Gratteri;
- Isnello;
- Pollina;
- San Mauro Castelverde;
- Aliminusa;
- Caccamo;
- Caltavuturo;
- Montemaggiore Belsito;
- Scillato;
- Sclafani Bagni.

Le Madonie sono poi suddivise in **Alte Madonie**, **Basse Madonie** e **Madonie Imeresi** (*Fig. 3a e 3b*). Le Alte Madonie comprendono i comuni di Gangi, Alimena, Bompietro, Blufi, Petralia Sottana, Petralia Soprana, Geraci Siculo, Polizzi Generosa e Castellana Sicula. Le Basse Madonie includono Collesano, Gratteri, Isnello, Castelbuono, Pollina e San Mauro Castelverde. Le Madonie Imeresi comprendono Caltavuturo, Scillato, Sclafani Bagni, Aliminusa, Montemaggiore Belsito e Caccamo.

Nelle sezioni successive si procederà all'analisi dettagliata di ciascun comune all'interno del Parco delle Madonie, con l'inclusione di un codice QR identificativo per facilitare l'accesso a ulteriori informazioni su ogni borgo.

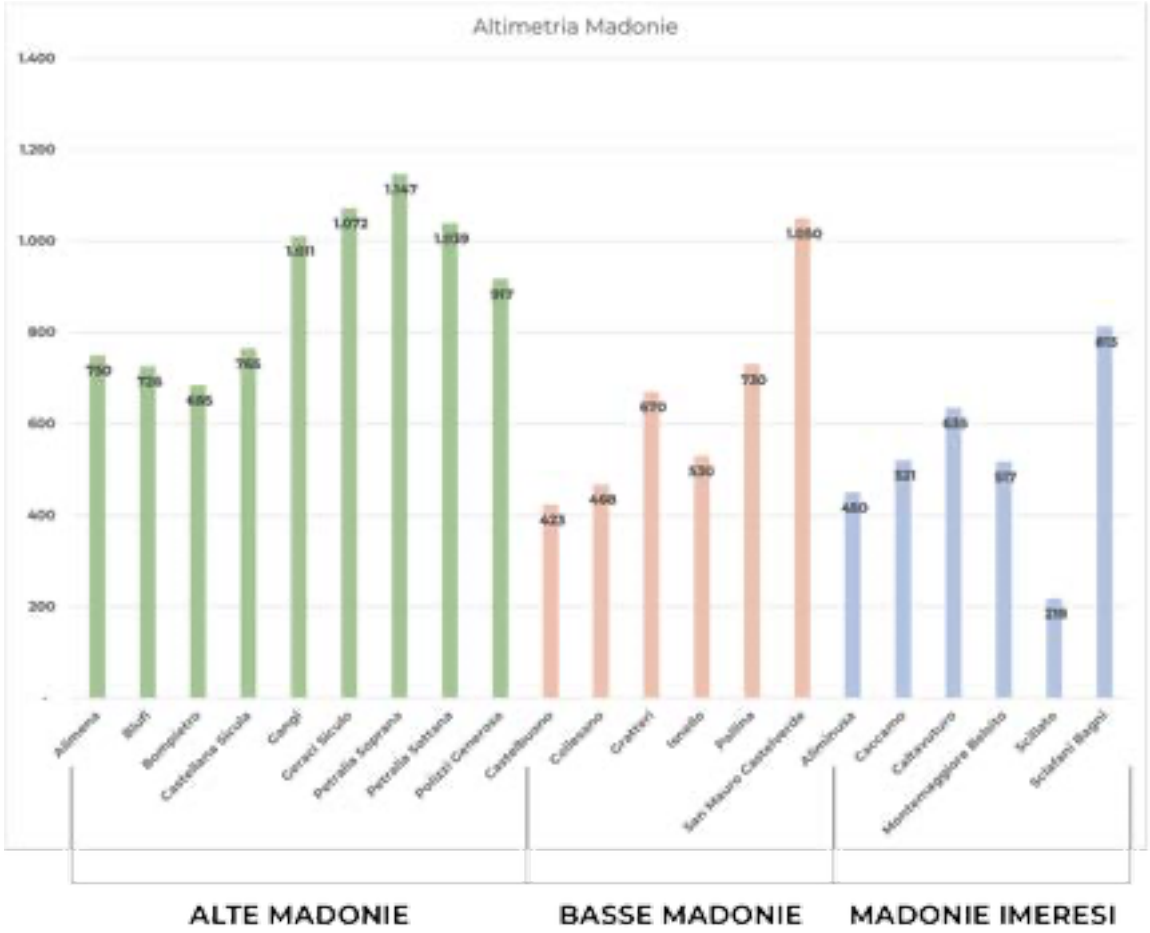
Tale approfondimento coprirà le seguenti aree tematiche: cenni storici, patrimonio architettoni-

[1] il Pizzo Antenna Grande o della Principessa (1977 m s.l.m.), il Pizzo Palermo (1964 m s.l.m.), il Monte San Salvatore (1912 m s.l.m.), il Monte Ferro (1906 m s.l.m.), il Pizzo Scalonazzo (1904 m s.l.m.), il Monte Quacella (1869 m s.l.m.), il Monte Mufara (1865 m s.l.m.), il Monte dei Cervi (1794 m s.l.m.), il Monte Daino (1780 m s.l.m.), il Monte Spina (1755 m s.l.m.), il Pizzo Antenna Piccola (1697 m s.l.m.), il Pizzo Catarineci (1660 m s.l.m.), il Monte Castellaro (1656 m s.l.m.), il Pizzo Cerasa (1559 m s.l.m.), il Pizzo di Fao (1538 m s.l.m.), il Cozzo Vituro (1507 m s.l.m.), il Monte Fanusi (1472 m s.l.m.), il Pizzo Canna (1429 m s.l.m.), il Pizzo Dipilo (1385 m s.l.m.), il Pizzo di Corcò (1357 m s.l.m.), il Monte Roccelito (1145 m s.l.m.), il Monte Balatelli (1125 m s.l.m.), il Pizzo Sant'Angelo (1081 m s.l.m.), e il Pizzo Cerro (933 m s.l.m.).

co e artistico, tradizioni e folklore, prodotti tipici, attività e attrattive turistiche, descrizione del territorio e dell'ambiente, come raggiungere i centri minori, servizi turistici, informazioni utili, curiosità e leggende, aneddoti e storie legate ai borghi e ai personaggi che li hanno abitati, leggende popolari e misteri del territorio. Saranno inoltre esaminate le sezioni riguardanti eventi e manifestazioni, con particolare attenzione alle sagre paesane, che comprendono feste religiose, eventi gastronomici e festival musicali, nonché mostre e rassegne. Ulteriori aspetti affrontati saranno la sostenibilità e il turismo responsabile, fornendo consigli per un turismo rispettoso dell'ambiente e delle comunità locali, con inclusione di iniziative e progetti di ecoturismo.

Completano l'analisi le sezioni riguardanti esperienze e itinerari, con suggerimenti per un'esperienza autentica nel Parco delle Madonie attraverso trekking, escursioni e tour tematici, e infine la presentazione di video promozionali.

Fig. 2 | Cartografia della Sicilia e individuazione dell'area del Parco delle Madonie, ©Luisa Lombardo, 2022



A

B

Alte Madonie

Basse Madonie

Madonie Imeresi

C

Parco delle Madonie

Confine GAL Madonie

Fig. 3 | a) Analisi dell'altimetria dei paesi del Parco delle Madonie, b) Divisione territoriale del comprensorio madonita, c) GAL Madonie, ©Luisa Lombardo, 2022

Il Parco delle Madonie; ©Carmelo Di Salvo, 2022

ALTE MADONIE

Alimena

Tra i fiumi Salso e Imera meridionale, il suo nome deriva da una bettola che sorgeva in cima a una collina, la cui insegna era un leone con in bocca una clava. L'origine risale al 1628, quando Antonio Alimena, un nobile palermitano, concesse la *licentia populandi* all'agglomerato urbano. La famiglia Alimena era succeduta alla nobile famiglia palermitana degli Imperatore, che aveva ottenuto il marchesato di Alimena per un privilegio emanato dal re di Spagna Filippo IV, fu quindi costruito il palazzo feudale della famiglia Alimena. Successivamente il dominio passò ai Benzo, poi ai Bosco, principi di Belvedere. Dopo la caduta del feudalesimo, il marchesato di Alimena, fu elevato a Comune. Il centro in passato fu assai prospero per via della fertilità delle sue terre e per la presenza di miniere di sale e zolfo. Alimena è un comune siciliano di origine seicentesca. Il suo nome deriva da una bettola che sorgeva in cima a una collina. In passato fu un centro prospero grazie alla fertilità delle sue terre e alla presenza di miniere. Ha una superficie di 59,7 km^{2}e 1.764 abitanti.

Blufi

Il nome del paese di Blufi probabilmente ha origini che risalgono al periodo arabo, come suggerisce il toponimo "Buluph". Questa denominazione compare anche nel libro di Villabianca, "Ponti sui fiumi di Sicilia", dove si fa riferimento al "Ponte di Belufi, seu di Petralia Sottana". In epoca medievale, il nome dell'attuale Blufi è strettamente associato al santuario della Madonna dell'Olio, un luogo di culto situato a meridione del massiccio centrale delle Madonie. Le vicende storiche di Blufi sono legate a quelle di Petralia Soprana, di cui Blufi è stata frazione fino al 1972, anno in cui ha ottenuto l'autonomia amministrativa. Prima di diventare un comune autonomo, Blufi era parte integrante della comunità di Petralia Soprana, con cui condivideva le principali dinamiche socio-economiche e culturali. Oggi, Blufi è un comune che si distingue per il suo patrimonio storico e culturale, nonché per il suo paesaggio naturale caratterizzato da una notevole biodiversità. La superficie del territorio comunale rimane di 21,98 km^2, con una popolazione che, secondo gli ultimi dati, conta 889 abitanti.

Bompietro

Il toponimo, Buompietro fino al 1929, è un antroponimo. La sua origine risale all'epoca moderna, precisamente al XVII secolo. Le attestazioni documentate certe a proposito della costituzione del primo nucleo urbano sono esigue, così come sono prive di eventi e pagine memorabili le vicende storiche che contraddistinsero il borgo, fatta eccezione per la sua inclusione nel casale di Petralia Sottana, di cui seguì le sorti. All'inizio, nell'attuale nucleo urbano, vi era solo un carcere con i detenuti; in seguito giunsero anche i loro parenti, che si stabilirono nei dintorni e popolarono il centro. Ottenne l'autonomia amministrativa come comune nel 1852. Il suo patrimonio artistico, data la sua costituzione recente, non è costituito da numerose testimonianze storico-architettoniche. Tra esse si segnala la chiesa madre, edificata nel XVII secolo, al cui interno sono custodite pregevoli opere d'arte e notevoli dipinti. Ha una superficie di 42,28 km^{2}e 1.153 abitanti.

ALTE MADONIE

Castellana Sicula

L'origine di Castellana Sicula risale al XVIII secolo, quando il duca di Ferrandina dedicò il nome del paese alla moglie della famiglia Castellana di Spagna. Attirati dalle sue pianure ricche d'acqua e dal clima favorevole, agricoltori di Gangi, Petralia, Polizzi e Caltavuturo fondarono il primo insediamento urbano intorno al 1700. La zona era formata da tre feudi: Castellana, Fana e Maimone, attraversati da quattro Trazzere Regie. Vi erano sei nuclei abitativi: Castellana, Rione Calcarelli, Rione Frazzucchi, Rione Ospizio, Rione Sciocca, Rione Sciafè. Castellana e Calcarelli furono frazioni di Petralia Sottana per duecento anni, ma ottennero l'autonomia nel 1948. Ha progredito rapidamente con la costruzione di edifici pubblici, scuole, impianti sportivi e strutture culturali. Il paese è noto per i suoi murales, opere d'arte moderna affrescate sui muri delle case, attirando artisti italiani e stranieri. Vanta testimonianze archeologiche, pigiatoi scavati nella roccia e ipogei d'epoca paleocristiana. Ha una superficie di 73,2 km^2 e conta 3.115 abitanti.

Gangi

La presenza dell'uomo e di centri abitati nel territorio di Gangi è documentata da numerosi reperti che hanno condotto diversi studiosi a identificare l'attuale Gangi con l'antica città cretese di Engyon, situata o nei pressi di Gangivecchio o a Monte Alburchia. Si ritiene che la città sia stata distrutta durante la guerra dei Vespri e successivamente ricostruita sul vicino monte Marone, dove ancora oggi sorge. Il principale impulso all'espansione del paese fu dato dalla costruzione di edifici ecclesiastici, attorno ai quali si formarono diversi gruppi di abitazioni. Tuttavia, ciò avvenne successivamente alla costruzione del castello sulla cima del monte Marone nel 1318. L'impianto medievale che si è sviluppato nel corso dei secoli si mantiene ancora oggi pressoché inalterato, con l'eccezione di alcune nuove costruzioni risalenti agli anni trenta del Novecento nella parte più bassa del centro abitato. Attualmente, il comune di Gangi si estende su una superficie di 127,47 km^2 e conta una popolazione residente di 6668 abitanti.

Geraci Siculo

Lo storiografo Cesare Cantù nel 241 a.C. asseriva che Geraci fosse un borgo prospero. Tuttavia, le prime notizie certe di questo abitato, giungono durante la conquista araba, quando i "cronisti" dell'epoca lo nominarono "H.r.sah o H.rhah.". Geraci si presentava come una rocca forte con un piccolo castello, un luogo con una cospicua produzione fruttifera, campi prosperi, e un borgo ampio incastonato tra montagne imponenti e una fitta serie di giogaie. Dopo la conquista normanna, rimase per secoli sotto la famiglia Ventimiglia, che istituì la contea con il borgo come suo centro di potere. Il castello, simbolo della presenza dei Ventimiglia, fu ristrutturato e ampliato, diventando una fortezza militare senza fronzoli interni. Insieme ai principali edifici religiosi, il castello fu un elemento chiave nello sviluppo urbanistico del paese nel Medioevo. Ancora oggi, Geraci conserva l'influenza culturale della famiglia Ventimiglia e ha subito poche espansioni edilizie nel XX secolo. Il suo territorio si estende per 113,35 km^2, con una popolazione residente di 1820 abitanti.

ALTE MADONIE

Petralia Soprana

Ha radici che risalgono all'epoca romana, testimoniato dagli autori latini durante la conquista dell'isola. La sua fondazione è avvolta da incertezze, con divergenze tra gli studiosi sulla collocazione geografica dell'antica Petra e la sua precedenza rispetto a Petralia Sottana. Secondo l'Illuminato Peri, potrebbero essere state un unico nucleo abitato, separandosi in "Petra Superior e Petra Inferior." Il comune, situato sul versante meridionale del massiccio centrale, è il più alto nella zona madonita e nell'intera città metropolitana di Palermo, caratterizzato da un territorio dedicato principalmente all'agricoltura. L'urbanizzazione originaria ha subito nel corso dei secoli un'espansione coerente con il contesto geografico. Tuttavia, negli anni '60 e '70 la realizzazione di nuove abitazioni sparse ha contribuito alla creazione di nuovi contesti urbani estranei al nucleo storico.
Attualmente, Petralia Soprana, recentemente designata come borgo più bello d'Italia, ospita una popolazione di 3242 abitanti e si estende su un territorio di 56,1 km^2.

Petralia Sottana

La storia dell'insediamento di Petralia Soprana si riflette anche in quella di Petralia Sottana, poiché, per ragioni sconosciute, le due località si separarono solo a partire dal XI secolo. Nel XIV secolo, Petralia Sottana iniziò a svilupparsi intorno all'antica chiesa madre, posizionata sulla cima dell'attuale abitato, con i quartieri Pusterna e del Carmine che ancora oggi mostrano l'impianto originario medievale. Un ulteriore sviluppo si ebbe nel XVIII secolo, evidenziato da strade più ampie e rettilinee.
Il borgo si estende lungo il versante meridionale del massiccio centrale, con un terzo della sua superficie inclusa nell'area protetta del Parco delle Madonie. Le restanti parti del territorio degradano verso il centro dell'isola, testimonianza della predominante coltivazione cerealicola e della presenza di numerose architetture rurali. Attualmente, il comune di Petralia Sottana si estende su una superficie di 178 km^2 e conta una popolazione residente di 2730 abitanti.

Polizzi Generosa

Polizzi Generosa è un antico borgo il cui sito d'insediamento risale probabilmente all'epoca ellenistica. Il toponimo potrebbe derivare dalla parola greca "Polis" o essere legato al ritrovamento di una statua di Iside, chiamando il sito "Polis Isidis." Durante l'epoca bizantina, era conosciuto come "baseapolis" (città del Re). L'importanza di Polizzi si sviluppò durante il periodo arabo e la successiva dominazione normanna, quando il conte Ruggero fece costruire il castello e la rocca, guadagnando il soprannome di "Generosa" per la sua fedeltà al Re Federico II. La città mantenne una significativa importanza strategica, fungendo da nodo centrale per importanti vie regie durante il Rinascimento. Polizzi si apre su una vasta vallata dedicata principalmente alla coltivazione cerealicola, con interruzioni causate dal massiccio centrale calcareo a nord-est. Conserva la sua struttura urbana senza grandi fenomeni di espansione edilizia. Attualmente, il comune si estende su una superficie di 178 km^2, ospitando una popolazione di 2730 abitanti.

BASSE MADONIE

Castelbuono

Situato ai piedi di cozzo Milocca, Castelbuono ha radici che affondano nell'epoca bizantina, come testimoniato dal "casale d'ypsigro". L'origine del nucleo abitato attuale non può essere ricondotta esclusivamente al 1269, quando una parte della popolazione di Fisauli si trasferì nell'area in cui sorge oggi Castelbuono. Tale evento segna uno dei primi momenti dell'espansione della città. Per gran parte della sua storia, Castelbuono è rimasto sotto il controllo dei Ventimiglia, assumendo dal XVI secolo in poi il ruolo di "capitale dello stato di Geraci". Il primo nucleo di Castelbuono si sviluppò nel quartiere Terravecchia, precedente persino alla costruzione del castello. La strada che collega il castello alla chiesa madre, fino al XV secolo, risultava priva di costruzioni ai lati, indicando che solo agli inizi del XVI secolo avvenne l'espansione della città verso la fortezza dei Ventimiglia. Un ulteriore periodo di crescita si verificò nel XVII secolo con la creazione della matrice nuova secondo i principi costruttivi dell'epoca. Il comune ha una superficie di 60,79 km² e una popolazione di 8.016 abitanti.

Collesano

Il primo insediamento urbano di Collesano risale al periodo della dominazione araba, in cui il geografo Al Muqaddasi, nel X secolo, lo identifica con il nome di "Qal'at as-sirat" (rocca sulla retta via). Dopo la conquista normanna, il centro divenne noto come "Golisano". Inizialmente affidato ad Adelacia di Adernò, nipote del Re Ruggero, Collesano successivamente entrò nei possedimenti della famiglia Ventimiglia, rimanendovi per molti secoli. Un tempo vi sorgeva il castello, un modello insuperato di robustezza, intorno al quale potevano pascolare armenti di ovini e bovini; ma Re Ruggero lo fece dislocare nel posto dove oggi sorge la fortezza." Il paese si trova nella parte più alta di una vallata ai piedi del Poggio "la grotta del signore", delimitata ad Ovest dal Monte d'Oro. L'attuale configurazione di Collesano si è sviluppata complessivamente tra il XVIII e il XIX secolo. Il comune di Collesano ha una superficie di 108,17 km² e una popolazione di 3.605 abitanti.

Gratteri

Gratteri prende il nome dal torrente Crato, che lo attraversa scendendo da Pizzo Dipilo. Ritrovamenti archeologici suggeriscono la presenza umana sin dall'età del bronzo. Nel IV secolo, lo storico Filisto menziona un "Craterius oppidum Siciliae," probabilmente riferendosi a un insediamento nell'area di Gratteri. Un primo insediamento risale alla dominazione araba intorno al IX secolo, mentre la costruzione del castello avvenne durante la dominazione normanna. Subì l'influenza dei Ventimiglia fino all'abolizione della feudalità nel 1812. Gratteri offre una vista panoramica della costa tirrenica. Il paese è racchiuso tra il massiccio di Pizzo Dipilo, le cime di Pizzo Punti, Monte Macabubbo e Pizzo Giammarusa, al confine con Collesano. Torrenti come Piletto e S. Giorgio affiancano il paese, mentre i cozzo Carbone e Sillita sovrastano vallate boschive. Attualmente, il comune di Gratteri si estende su una superficie di 38,17 km2, con una popolazione residente di 926 abitanti.

BASSE MADONIE

Isnello

Isnello, un pittoresco paese madonita, trae il suo nome dal fiume Asinello, noto per le sue acque di qualità. Nonostante l'incertezza sulla fondazione, antiche radici risalgono all'epoca normanna. A differenza di molti paesi delle Madonie, Isnello fu meno influenzato dalla dinastia Ventimiglia, ma fu piuttosto plasmato dal potere ecclesiastico della Diocesi di Cefalù e dalle famiglie Santacolomba e Valguarnera, che ne guidarono le sorti fino al 1788. Dal punto di vista geografico, Isnello confina con Castelbuono a est, le Petralie e Polizzi a sud, Gratteri a nord-ovest e Cefalù a nord-est. Morfologicamente, è situato tra i rilievi di Pizzo Carbonara a sud-est e Pizzo Dipilo a nord, con una struttura urbana che richiama le influenze arabe, caratterizzata da stretti vicoli che si adattano al terreno e si sviluppano in quattro quartieri distinti, attraversati da due assi che si incrociano quasi nel centro dell'abitato. Si estende su un territorio di 51 km^2, con una popolazione residente di 1.545 abitanti. È sede del centro internazionale per le scienze astronomiche Gal Hassin.

Pollina

Cluverio identifica l'attuale Pollina con l'antica Apollonia, risalente all'arrivo dei Greci nell'isola nel VII secolo a.C. Il nome Apollonia persiste anche in epoca romana, quando i Romani battezzarono una nave con tale nome, riservando questo trattamento alle città di rilevanza. Durante gli arabi, Apollonia divenne Abulloniah, mentre sotto il controllo dei Normanni, la città, conosciuta come casale Polla, fu inclusa prima nella diocesi di Troina e successivamente in quella di Cefalù. In questo periodo, fu costruito il castello dei Ventimiglia nella parte più elevata del paese, e negli anni settanta del Novecento fu realizzato il teatro di Pietrarosa seguendo il modello dei teatri greci. L'impianto urbano di Pollina si sviluppa in due insediamenti: il primo, nella parte più alta, conserva l'antica struttura medievale; il secondo corrisponde all'insediamento di Finale di Pollina, nei pressi dell'antica torre a mare a 9 km di distanza dal centro storico. Attualmente, il comune di Pollina si estende su una superficie di 49,9 km^2 e conta una popolazione di 2950 abitanti.

San Mauro Castelverde

L'origine di Castelverde è incerta, ma la presenza di un abbeveratoio noto come "bevaio dei greci" suggerisce un antico insediamento in epoca non definita. Durante l'epoca bizantina, il processo di incastellamento per scopi difensivi portò probabilmente alla costruzione del castello. Il castello fu presumibilmente distrutto durante l'occupazione araba, evidenziata dai nomi di alcune contrade. Sotto i Normanni, Castelverde fu incluso nella contea di Geraci, rimanendo sotto il controllo dei Ventimiglia fino all'abolizione della feudalità nel 1812. Il nome del paese è probabilmente legato a Santo Mauro Abate, ma l'appellativo di Castelverde fu assegnato dopo l'unificazione d'Italia per distinguerlo da altri paesi omonimi. Situato sull'omonimo monte, Castelverde rappresenta l'ultima propaggine delle Madonie al confine con le Caronie e i Nebrodi. Caratterizzato da un territorio montano, si estende su 114,37 km^2 con una popolazione residente di 1554 abitanti.

MADONIE IMERESI

Aliminusa

Aliminusa ha origini che risalgono al XV secolo. Il suo nome potrebbe derivare dall'arabo "Armisch", che significa "valle desolata e senza acqua". Fino al Seicento, il territorio era scarsamente popolato, caratterizzato da pochi abbeveratoi, mulini e masserie. Durante questo periodo, i baroni locali iniziarono a costruire abitazioni e Aliminusa fu inclusa in un progetto di espansione demografica.
Il feudo di Aliminusa passò successivamente alla famiglia Peralta dei Conti di Luna, che eresse una struttura chiusa denominata Baglio. La gestione del feudo cambiò nel corso dei secoli, passando da diverse dinastie, tra cui i Moncada, gli Aragona, il Barone Gregorio Bruno e la famiglia Cutelli. Nel Settecento, la cittadina fu affidata al principe Ignazio Vincenzo Paternò, e successivamente ceduta ai Bonaccorsi e ai baroni Milone. Nel 1812, Aliminusa ottenne lo status di comune autonomo. Oggi, con una popolazione di oltre 1.000 abitanti e una superficie di 1.371 ettari, Aliminusa è considerata un importante simbolo per la Sicilia.

Caccamo

Caccamo ha una vasta superficie di 18.780 ettari, confinando con vari comuni. Le origini della città sono dibattute, il nome potrebbe derivare dal punico-cartaginese, greco, latino, arabo o siciliano. Fondata dai Cartaginesi nel IV-V secolo a.C. dopo la sconfitta a Himera. Nel 1093 il Conte Ruggero assegna Caccamo alla diocesi di Agrigento. Nel 1094, diventa un feudo normanno sotto Goffredo de Sagejo, passando poi alla famiglia Bonello. Il castello gioca un ruolo cruciale durante la "congiura dei baroni" nel 1160. Nel 1392, i Chiaramonte subiscono la distruzione definitiva, e Caccamo passa a Gueraldo Queralt. Seguono periodi di dominazione Chiaramontana, Cabrera e Henriquez-Cabrera, durante i quali Caccamo conosce sviluppo economico e culturale. Nel 1643, la città ottiene il titolo di città e nel 1646 è elevata a ducato. Nel 1813, passa alla famiglia De Spuches, notevole per il restauro del castello. Caccamo partecipa agli avvenimenti storici della Sicilia e dell'Italia, inclusi i moti risorgimentali. Ha una superficie di 188,23 km^{2}e 7.736 abitanti.

Caltavuturo

L'insediamento iniziale di Caltavuturo sembra risalire all'epoca bizantina, inserendosi nel più ampio contesto di fortificazioni difensive realizzate durante l'VIII secolo. Alcune fonti storiche attribuiscono la fondazione del paese al condottiero musulmano che vi si stabilì e fondò Qal'at Abi l-Thawr. È probabile che il primo insediamento si trovasse nella zona dove oggi sorge il castello di Terravecchia. Tuttavia, questo sito fu abbandonato nel XVII secolo, portando alla nascita del moderno centro abitato di Caltavuturo, situato ai piedi del monte Rocca di Sciara. Attualmente, il territorio del comune di Caltavuturo si estende su circa 97,95 km^2 e ospita una popolazione di 3.926 abitanti. L'economia del paese è prevalentemente basata sulla coltivazione estensiva di cereali e sull'allevamento, e il paesaggio è caratterizzato dalla presenza di diciassette masserie, la maggior parte delle quali risale al XIX secolo. La transizione dall'antico insediamento alla configurazione attuale riflette una storia di adattamento e sviluppo che ha modellato il volto di Caltavuturo nel corso dei secoli.

MADONIE IMERESI

Montemaggiore Belsito

Il toponimo derivante dal latino *MONS MAJOR* ha un significato evidente, con l'aggiunta del determinante nel 1863 per distinguere la denominazione comune. Dopo la cacciata dei Romani, gli Arabi amministrarono il borgo per un lungo periodo. Le prime testimonianze documentate sulla costituzione del nucleo urbano risalgono al periodo medievale, all'arrivo dei Normanni in Sicilia, con Ruggero I, interessato alla giurisdizione del borgo e alla costruzione di un monastero basiliano per promuovere la cultura normanna. Nel XVI secolo, l'amministrazione del casale fu gestita dalla famiglia nobile dei Migliaccio. Tra le testimonianze storico-architettoniche degne di nota nel patrimonio artistico di Baucina, ci sono la chiesa madre dedicata a Sant'Agata, con un dipinto di Giuseppe Salerno, la parrocchiale del Crocifisso del 1675, il Palazzo del Principe di Baucina in stile neoclassico risalente al XIX secolo, e il Palazzo della famiglia Saeli costruito nel XX secolo. Ha una superficie di 32,36 km^{2}e 2.895 abitanti.

Scillato

L'origine di Scillato, come per molti paesi delle Madonie, è oggetto di controversie. Ciò che è certo è che la nascita dell'insediamento umano è sempre stata legata all'abbondante presenza di acqua, testimoniata dai numerosi mulini. Il primo di essi risale al 1196 in contrada Fondaco, e secondo l'avvocato Pasquale Cipolla, questo rappresenta il momento della nascita del borgo. La crescita di Scillato è stata sempre associata all'attività molitoria e alle vicende della contea di Sclafani, fino a quando nel 1861 è entrata a far parte del comune di Collesano, riacquistando la sua autonomia nel 1961. L'insediamento di Scillato ha avuto origine ai piedi di Monte Cervi, lungo i corsi d'acqua Agnello e Golfone, dove sorsero le prime abitazioni, mulini, magazzini, la chiesa e le "stazioni di posta" per i commercianti. Attualmente, il comune di Scillato si estende su una superficie di 31,7 km^2 e ha una popolazione residente di 614 abitanti.

Sclafani Bagni

L'origine di Sclafani Bagni rimane incerta, ma le prime ipotesi risalgono alla fine del XIX secolo. Secondo Rosario Termotto, Pasquale Cipolla attribuisce il paese al periodo greco, noto come "Ambica" e successivamente "Aesculapii Fanum" durante la dominazione musulmana chiamato "Isqlafinah". Le prime notizie certe risalgono all'anno 938 d.C. durante il periodo normanno, quando Sclafani, pur di dimensioni ridotte, era considerato un "oppidum" con un territorio costellato di casali e acque sulfuree. Questo portò alla creazione della contea di Sclafani, immune dall'influenza dei Ventimiglia e guidata da Matteo Sclafani e poi dalla famiglia Alvarez de Toledo.
La posizione geografica ha preservato l'impianto medievale di Sclafani, con tracce delle mura e del castello. Il paese si erge su uno sperone costeggiato dal torrente Salito, ovest di Caltavuturo, mantenendo un aspetto paesaggistico intatto. Il territorio comunale si estende su 134,9 km^2 con una popolazione di 426 abitanti.

3.3 - ANALISI DEI CARATTERI TECNICO-COSTRUTTIVI DELL'EDILIZIA STORICA DELLE MADONIE

Alimena

Bompietro

Caltavuturo

Blufi

Castellana Sicula

Gangi

Geraci Siculo

Gratteri

San Mauro Castelverde

3.3.1 - Il tessuto urbano e l'edilizia di base

Il tessuto urbano nell'area delle Madonie si configura come risultato dell'interazione tra la topografia dei siti e le condizioni climatiche, elementi determinanti nella formazione delle singole unità abitative.

Questo tessuto si caratterizza per la presenza di complessi urbani a densità medio-alta, dove isolati compatti si alternano a strade strette e tortuose, scalinate, archi, slarghi e piazze, dando vita a una trama urbana ricca di varietà e dinamismo.

Le tipologie di aggregazione presenti nell'area mostrano una notevole diversità, influenzate dal contesto naturale circostante. Tuttavia, emergono elementi comuni quali la compattezza dei volumi e la serialità degli elementi tipologici e costruttivi delle unità residenziali. Questa omogeneità strutturale contribuisce a conferire un'identità architettonica distintiva all'intera regione madonita.

L'architettura locale è profondamente influenzata dai materiali da costruzione e dalle tecniche costruttive utilizzate, strettamente legate alle risorse locali, alle limitazioni tecniche ed economiche, nonché alle sfide dei collegamenti e dei trasporti. La risposta creativa a tali vincoli ha portato all'emergere di soluzioni tecniche e forme originali, contribuendo a definire un paesaggio architettonico unico.

Grazie a queste peculiari caratteristiche, l'area delle Madonie si distingue per la sua ricchezza culturale e architettonica, offrendo un contesto in cui tradizione e innovazione si intrecciano in modo armonioso. L'analisi dettagliata di tali elementi contribuisce a una comprensione più approfondita delle peculiarità di ogni unità abitativa e a una valorizzazione delle radici culturali e storiche che caratterizzano questo suggestivo territorio.

La struttura portante del complesso edilizio è costituita da calcare compatto o quarzarenite, proveniente dalle cave circostanti. Le varietà di materiale più robuste e a grana fine sono riservate per la realizzazione di elementi decorativi quali portali, cornici, stipiti e ornamenti vari. Le generose dimensioni delle murature sono state attentamente selezionate per conferire loro la resistenza necessaria agli eventi sismici, migliorando contemporaneamente il comfort interno. Tuttavia, la lavorazione meno raffinata del materiale rende più complesso il posizionamento in loco. Il laterizio assume un ruolo predominante nelle zone caratterizzate dalla presenza di antiche fornaci, seguendo scrupolose regole artigianali per la creazione di archi, volte e dettagli decorativi o strutturali, come cornici, pavimenti e rivestimenti di tubature di scarico. Il legno è impiegato nella realizzazione di solai, sia orizzontali che inclinati, con campi riempiti di canne palustri di grosso diametro, legno o sughero per garantire leggerezza e isolamento termo-acustico.

La raccolta delle acque piovane, sebbene rara, è generalmente gestita attraverso l'utilizzo di cornicioni "alla cappuccina", con coppi sfalsati poggiati su pianelle di laterizio per proteggere gli accessi. Portali e balconi presentano pietra squadrata collegata tramite piattabande o archi, con conci nei piedritti per una migliore integrazione con la muratura. Gli archivolti possono essere realizzati in pietra o mediante l'uso di mattoni e pietra disposti a coltello. I balconi possono essere realizzati in pietra locale, con dettagli complessi, oppure in marmo, caratterizzati da design più sobri. Mensole, grate e ringhiere sono attentamente realizzate in ferro e ghisa, conferendo un'eleganza duratura agli elementi architettonici.

Le strutture verticali prive di intonaco esterno agevolano un'analisi dettagliata, specialmente nei contesti di ruderi o edifici abbandonati. La muratura, frequentemente composta da pietrame informe per motivi economici, si caratterizza per la presenza di conci diatoni penetranti nei setti. Esternamente, la pietra sbozzata è ampiamente diffusa, seguendo una disposizione pseudo-isodoma. La presenza di pietrame minuto, utilizzato in maniera casuale nelle aree edilizie meno opulente, crea un contrasto con le murature più ordinate riscontrabili nelle grandi città. Sono osservabili murature listate, con pietra compatta rasata ad intervalli inferiori al metro, e conci squadrati alternati a nuclei di pietrame informe. Nelle murature in laterizio, si osservano disposizioni manuali con listature, riempimenti e fasce orizzontali ornamentali. Nei cantonali, blocchi lapidei squadrati creano indentature, mentre catene metalliche e portali lapidei adornano l'edilizia di base. Le aperture al piano terreno sono spesso decorate, e l'utilizzo combinato di mattoni e pietra crea effetti decorativi. Le volte in conci sono rare, ma strutture sottili in getto o laterizi sono comuni, includendo varianti come volte realine e volte in mattoni sottili. Nel contesto dei solai, le travi in legno risultano comuni, con interassi ridotti a causa delle limitate dimensioni fornite dai boschi locali. L'impiego di profilati a doppio T è sporadico e più oneroso. Gli impalcati evidenziano una ricerca di soluzioni economiche, adoperando tavole su tre appoggi o tavole rustiche a maggiore spessore per riempire gli spazi tra le travi, tronchi rustici, stuoie di canne o listelli. Le chiusure dei campi di orditura sono realizzate con getto di gesso miscelato a vari aggregati, spesso con forma a volta a botte. Le scale interne, strette e realizzate con strutture a volta

Gangi; ©Carmelo Di Salvo, 2022

o con solai lignei ad asse rampante, evidenziano un approccio pratico. I controsoffitti, piani o a "finta volta", sono realizzati con tessuto di canne schiacciate supportato da centinature in tavole accoppiate e chiodate. Le finiture intradossali prevedono superfici continue di intonaco, talvolta con cappa estradossale in malta di gesso. I tramezzi sono costituiti da un'ossatura in legno rivestita su entrambi i lati, con soluzioni più raffinate o rustiche a seconda del contesto. I cornicioni fungono da protezione per le facciate e supportano le ultime file di coppi in aggetto. La pratica costruttiva più comune, denominata "alla cappuccina", prevede l'utilizzo di elementi laterizi piani e curvi sovrapposti in varie forme e spessori, aggettanti in modo diverso per allontanare l'acqua dalla parete esterna. Altri tipi di cornicioni presentano mensole sottili e sagomate che sorreggono il pianellato orizzontale terminale.

Gli embrici in lamiera sagomata seguono le forme del cornicione o, in assenza di questo, sono sostenuti da mensolette in pietra o mattone. Si notano anche dettagli minori, come finestre con davanzali adatti a scopi di servizio. Le facciate sono arricchite da mensole e ferrate dei balconi, con disegni e forme variabili. I suoli esterni sono costituiti da lastre di pietra compatta o da un sistema "a pacchetto" con griglia metallica, lastre sottili in ardesia e pavimentazione. Le pavimentazioni esterne, spesso realizzate con selciati, presentano disegni geometrici che delimitano campi con guide e catene in pietra compatta. Il tessuto urbano delle Madonie non solo rappresenta un esempio di adattamento alle condizioni ambientali e climatiche, ma anche un patrimonio architettonico di grande valore, dove tradizione e innovazione si fondono in un equilibrio armonioso.

Caccamo; ©Tania Meli, 2022

Selciato con guide e campi in pietra compatta irregolare
Blufi

Lastricato in pietra di mirto
Polizzi Generosa

Porfido a raggiera
Caltavuturo

Porfido a raggiera
Alimena

Selciato in pietra compatta irregolare con guide in mattoni
Polizzi Generosa

Selciato con guide e campi in pietra compatta irregolare
Caltavuturo

3.3.2 - Tipologie edilizie

ABACO DELLE TIPOLOGIE EDILIZIE DELLL'AREA MADONITA

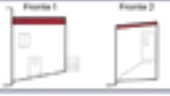
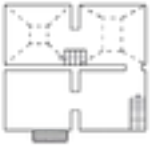
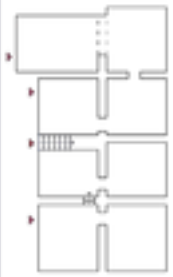
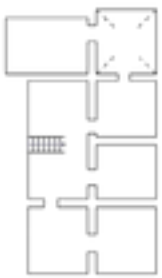
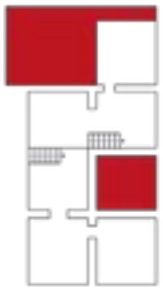
		Primo Livello	Secondo Livello	Terzo Livello	Quarto Livello	Prospetti
1	Casa Terrana: Cellula-base elementare con unico accesso da strada					
2	Casa Solerata: Cellula-base elementare con vano a livello superiore originariamente adibito a zona notte. La scala è amovibile.					
3	Unità edilizia con due cellule-base sovrapposte ed accessi separati.					
4	Unità edilizia con due cellule-base sovrapposte ed accessi separati. Soluzione d'angolo.					
5	Unità edilizia derivante dall'accorpamento di una cellula-base [eventualmente soppalcata] e una "solerata". Rimangono gli accessi indipendenti.					
6	Unità edilizia su due elevazioni, compresa tra due strade a quota diversa. Accessi indipendenti per ogni livello.					
7	Unità edilizia su due elevazioni con scala interna ("annito") e pianerottolo-tavoliere su volta a protezione dell'accesso al piano inferiore.					
8	Unità edilizia su tre elevazioni con forte dislivello tra le due fronti su strada; notevole profondità e ridotto sviluppo su strada. Scala in posizione baricentrica ed accessi diretti su strada.					
9	Ipotesi di evoluzione di edilizia di base: aggregazione di unità-base adiacenti sia lungo la strada che in profondità con sopraelevazioni.					
10	Palazzetto su tre elevazioni fuori terra. Può ipotizzarsi l'accorpamento progressivo delle unità-base adiacenti con l'eliminazione delle scale dei corpi laterali e la permanenza di un'unica scala in posizione baricentrica.					

Fig. 1 | Rielaborazione grafica dell'edilizia di base ricorrente, ©Luisa Lombardo, 2022

L'edilizia minore delle Madonie si adatta alle necessità abitative improntate all'efficienza, con forme geometriche semplici riproposte in modo iterativo. Le diverse configurazioni aggregative sono strettamente legate alla disposizione del terreno e delle strade circostanti. Quando gli isolati seguono la massima pendenza in modo lineare, il corpo di fabbrica doppio è suddiviso in alloggi con un solo affaccio sulla strada e un massimo di due piani. Al contrario, su strade pianeggianti in zone con forti pendenze, gli isolati sono spesso costituiti da un solo corpo di fabbrica, con affaccio doppio solo ai piani superiori, accessi su strade a diverse quote e uno sviluppo verticale accentuato sul lato a valle.

Un'altra variante aggregativa è la disposizione "a schiera doppia" o "a spina", in cui ogni unità ha un solo lato libero e si trova adiacente alle due unità laterali e a quella retrostante. In termini di orientamento, questa disposizione è preferita quando la disposizione è prossima all'asse nord-sud, consentendo l'illuminazione della facciata est al mattino e di quella ovest al pomeriggio. Nei casi in cui l'orientamento segue l'asse est-ovest, la configurazione a schiera singola, garantendo l'irraggiamento della facciata a sud di tutte le unità abitative, risulta più comune.

Sono comuni anche aggregazioni di tipo casuale, creando una configurazione plano-altimetrica articolata con profondità e altezze variabili dei corpi di fabbrica, geometrie distributive in pianta diverse e volumi alternati. Questa disposizione è spesso caratterizzata dalla presenza di "vuoti" come passaggi coperti, cortili, vicoli e piazze, che alleggeriscono la trama densa del tessuto urbano.

Le abitazioni di base su tutto il territorio montano delle Madonie sono principalmente a un piano (terranas) o a due piani (case solerate). Queste costituiscono le unità abitative di base che, con l'evoluzione spaziale attraverso crescita volumetrica, accorpamenti e raddoppi in facciata o in profondità, danno origine a una casistica articolata di varianti per rispondere alle nuove esigenze e ai nuovi modelli abitativi.

Le case terrane si evolvono naturalmente in case solerate, aggiungendo un soppalco ligneo vicino alla parete di fondo, accessibile tramite una scala a pioli. La sopraelevazione delle case monocellulari a un piano, con la conseguente separazione verticale delle funzioni, prevedeva la realizzazione di scale esterne parallele al prospetto, chiamate annìti, specialmente su strade a forte pendenza. Questi annìti erano realizzati con una parte della rampa su un nucleo in muratura e il pianerottolo su una volta a botte che incorniciava e proteggeva l'accesso al locale terrano. Il pianerottolo dell'annìto fungeva anche da spazio all'aperto privato, un surrogato del balcone.

Le unità abitative "a schiera", adiacenti lungo la strada, stabiliscono un collegamento diretto tra lo spazio privato della residenza e lo spazio pubblico della strada, limitando la presenza di aree aperte a balconi e pianerottoli. Nei casi di aggregazione casuale, gli slarghi e i vicoli ciechi fungono da spazi aperti comuni, svolgendo molte attività diurne durante i periodi più caldi. In queste situazioni, il confine tra spazio esterno pubblico e privato diventa più flessibile. Le abitazioni, specialmente le terrane, erano spesso utilizzate come stalle e magazzini a causa della scarsa illuminazione e ventilazione, ma svolgevano anche una funzione abitativa di base.

In casi di aggregazioni più complesse, con la fusione di due o più unità di base, si risolvono anche i problemi igienico-sanitari e si creano abitazioni autonome. In queste abitazioni ottenute dalla fusione di unità adiacenti, un corpo è destinato a magazzino e l'altro all'abitazione, con una cucina al piano terra e un'eventuale alcova al piano superiore. L'aggregazione verticale su tre livelli propone solitamente la zona non residenziale al piano terra, la cucina/zona giorno all'ultimo piano e la camera da letto al piano intermedio. Gli esempi di aggregazioni tra unità adiacenti, con sovrapposizione, hanno portato alla formazione di "palazzetti" in condomini familiari, con un accesso unificato e la rimozione delle scale laterali, arricchendo spesso il prospetto con balconi, cornicioni e portali.

Ulteriori varianti sono presenti nelle differenze tipologiche e formali tra le case di testa, ad angolo e quelle comprese all'interno della stecca edilizia. Pur mantenendo soluzioni planimetriche simili, le facciate architettoniche differiscono in base alla posizione degli accessi, alla collocazione delle scale esterne e alla presenza di pareti cieche o forate. (Fatta er al, 2007)

3.3.3 - I beni isolati

Mentre il resto d'Europa sperimentava l'industrializzazione tra la fine del XVIII e l'inizio del XIX secolo, la Sicilia, e in generale il Mezzogiorno italiano, rimanevano ancorati a una società fortemente gerarchica e influenzata dal latifondismo. Ciò diede origine a diverse forme di attività produttive preindustriali, che sfruttavano in modo limitato le risorse naturali.

Le masserie rappresentano la principale manifestazione dell'utilizzo produttivo del territorio delle Madonie. Tuttavia, oltre a queste, la regione è caratterizzata da altre forme di architetture rurali che testimoniano la costante presenza dell'uomo nelle attività agro-pastorali. Tra queste vi sono numerose case sparse, che costituiscono parte integrante del patrimonio tradizionale fisso del territorio.

Oltre ai castelli, che pur non rientrando tra le architetture rurali devono essere menzionati per la loro presenza nei borghi, finalizzata a esaltare il potere nobiliare, le Madonie presentano numerose strutture che sfruttano la forza motrice dell'acqua dei torrenti locali. Nel corso dei secoli, lungo questi corsi d'acqua, si sono sviluppati percorsi che facilitavano l'attraversamento del territorio.

Fino agli anni tra le due guerre mondiali, in Sicilia e nelle Madonie era attiva una rete estesa di mulini, principalmente idraulici, concentrati vicino ai corsi d'acqua. Questi mulini, utilizzati per trasformare il grano, rappresentano oggi una testimonianza della civiltà contadina, sebbene siano in gran parte scomparsi. La presenza di coltivazioni cerealicole estensive nelle Madonie giustifica l'alto numero di mulini lungo i corsi d'acqua.

Un altro esempio significativo di architettura tradizionale produttiva è la cartiera Turrisi a Castelbuono. Nel 1821, questa struttura venne trasformata da un'antica fonderia in un luogo per la produzione di carta. Tuttavia, la concorrenza inglese e le spese eccessive portarono alla sospensione dell'attività nel 1842.

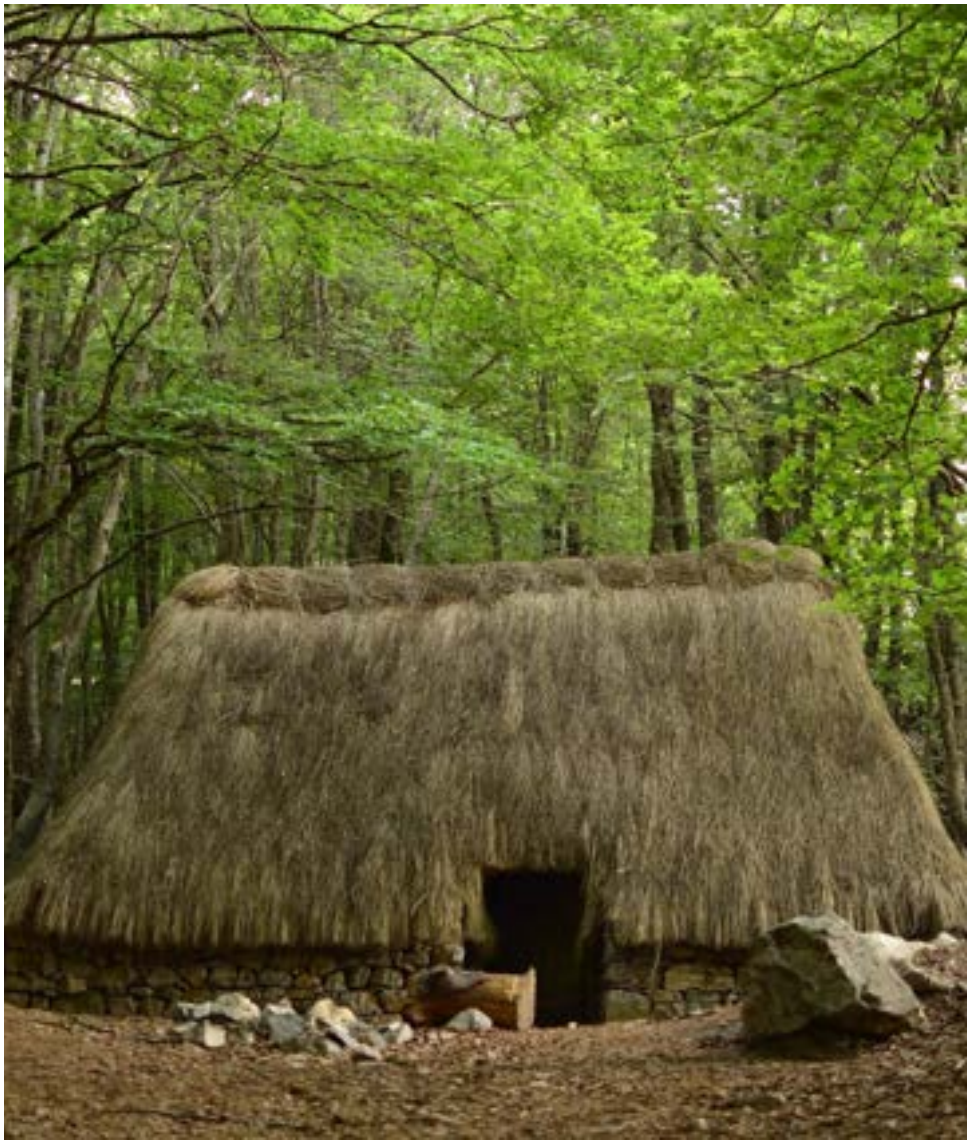
Oltre alle masserie e ai mulini, vi sono i pagliai, utilizzati per l'abitare temporaneo durante il periodo del raccolto e della semina. Altri esempi di architettura rurale temporanea sono i "marcati" (ovili), utilizzati per l'allevamento degli animali lungo le antiche vie della transumanza.

La forte fede religiosa della regione è evidente nei numerosi santuari, conventi, abbazie ed eremi sparsi in tutto il territorio delle Madonie. Questi luoghi, sebbene abbiano funzioni diverse rispetto a masserie, mulini o cartiere, rappresentano un patrimonio unico, con un elevato valore storico, culturale e antropologico.

Le Madonie conservano un patrimonio architettonico variegato che riflette la cultura e l'identità della regione. L'attenzione a queste architetture tradizionali, spesso abbandonate e dimenticate, può contribuire alla valorizzazione e conservazione del patrimonio culturale del territorio.

Masseria Susafa; ©Susafa, 2021

Mulino Malia; ©Quelli del Parco delle Madonie, 2022



Pagghiuaru; ©Enrico Cerami, 2022

Santuario della Madonna dell'Alto; ©Quelli del Parco delle Madonie, 2022

VALUTAZIONE DELLA QUALITÀ AMBIENTALE DEGLI EDIFICI STORICI

Parco delle Madonie; ©Salvatore Di Venuto, 2022

La progettazione architettonica, intesa come attività finalizzata alla modellazione dello spazio, è un processo complesso che coinvolge molteplici componenti, difficilmente riassumibili in regole semplicistiche e deterministiche. Il concepimento dell'architettura ha evoluto la sua attenzione verso fattori psicologici, l'uso di materiali locali, le tradizioni costruttive autoctone e l'integrazione della nuova edilizia con quella storica esistente. In Italia, si è sviluppato un approfondito studio sugli interventi nei centri storici, concentrandosi sui concetti di percezione dell'ambiente antropizzato e del paesaggio, influenzati dagli strumenti di rappresentazione e comunicazione.

Recentemente, è emersa una crescente consapevolezza riguardo alla continua distruzione fisica dell'ambiente, con lo sviluppo di diverse modalità di "fare architettura". A seconda dell'enfasi posta su determinati aspetti ambientali, sono stati coniati termini quali architettura ecosostenibile, bioclimatica, solare, ecologica, bioecologica e bioarchitettura, per delineare paradigmi o strategie progettuali con specifiche sfumature. In particolare, l'architettura bioclimatica si concentra sull'orientamento dell'edificio per ottimizzare il guadagno solare e ridurre i consumi energetici, sfruttando la conoscenza della posizione del sole per disporre adeguatamente le aperture e regolarne l'ampiezza e le protezioni.

La bioarchitettura, invece, privilegia l'aspetto biologico-naturale, mirando a proteggere la salute umana e a conservare le risorse non rinnovabili attraverso l'uso di materiali naturali. Il primo capitolo del libro analizza questi aspetti dell'architettura, introducendo il tema della qualità ambientale attraverso una prospettiva storica del rapporto tra edificio e ambiente. È stata la rivoluzione industriale a sconvolgere una relazione in cui la natura predominava e le risorse erano sufficienti a soddisfare le esigenze umane. La consapevolezza degli errori del passato e la conseguente distruzione di risorse hanno spinto i paesi avanzati a cercare condizioni di equilibrio ambientale migliori, controllando i costi economici per raggiungere tali obiettivi. Questo ha portato alla diffusione del concetto di sostenibilità, la cui centralità, sebbene ampiamente riconosciuta, è spesso messa in discussione da azioni locali contrarie.

I capitoli successivi si spostano dall'ambito architettonico a quello tecnico. Nell'ambito edilizio, un edificio può essere visto come un insieme di strutture che delimitano o racchiudono uno spazio ambientale interno, un sistema che costituisce un ambiente confinato, separato dall'esterno. L'involucro dell'edificio regola il passaggio di persone, animali, oggetti fisici ed energia. La metafora della farfalla e dell'elefante viene utilizzata per illustrare la variabilità della risposta climatica degli edifici. La farfalla, con la sua pelle leggera e la rapida adattabilità alla temperatura esterna, rappresenta un edificio trasparente, leggero e "adattivo", mentre l'elefante, con la pelle pesante e la minore sensibilità al clima esterno, simboleggia un edificio chiuso, massivo e inerte alle variazioni climatiche.

L'involucro dell'edificio "farfalla" avrà una resistenza termica elevata ma una bassa inerzia termica; al contrario, l'edificio "elefante" avrà un'alta inerzia termica e una significativa resistenza derivante dalla massa presente. L'aspettativa di vita sarà maggiore per l'edificio isolato e massivo, che è meno influenzato dalle variazioni esterne. Pertanto, la sensibilità tecnica del progettista deve consistere nell'intuire il funzionamento del manufatto nel contesto climatico-ambientale e proporre soluzioni in grado di soddisfare gli obiettivi di adattamento prefissati.

Una volta identificati i parametri rilevanti, la progettazione deve perseguire obiettivi di qualità e logiche prestazionali. La qualità ambientale di un edificio (*environmental quality*) misura il grado di soddisfazione di una serie di requisiti ambientali, che devono essere esplicitati e verificati. I requisiti ambientali mirano principalmente alla sostenibilità ecologica o ecosostenibilità durante le fasi di vita dell'edificio (produzione dei componenti, messa in opera, esercizio e dismissione), ma riguardano anche la tutela della salute e il benessere delle persone. Questa qualità è in parte imposta per legge e in parte il risultato di azioni volontarie da parte degli operatori del settore edilizio, orientate a raggiungere obiettivi di salute, comfort e riduzione dei consumi.

Il secondo capitolo presenta i principali sistemi di valutazione della qualità ambientale, mentre i tre capitoli finali analizzano i requisiti principali, individuando tre ambiti di applicazione: la tutela della salute, il benessere e la riduzione del consumo di energia. Esistono vari metodi per valutare la qualità, sia a livello dell'intero fabbricato che dei singoli componenti.

Una delle principali difficoltà nell'elaborazione dell'Atlante è consistita nella sintesi della frammentazione normativa e della sua continua evoluzione. Molte leggi nazionali in materia ambientale derivano da direttive europee e si specializzano a livello regionale, con l'aggiunta di numerosi norme tecniche

e regolamenti locali. I requisiti sono stati esaminati con particolare attenzione alla loro applicazione nella pratica edilizia comune.

La trattazione si è focalizzata sul contesto delle Madonie, ampiamente conosciuto, con immagini tratte da questo territorio frutto di anni di ricerca dottorale e della collaborazione di cittadini interessati alla conoscenza del territorio, anche da chi non vi è mai stato. È emerso come spesso le norme siano disattese per difficoltà tecniche o economiche nel verificare e controllare le costruzioni, e come l'introduzione di requisiti tecnici richieda figure professionali specializzate con competenze investigative e analitiche avanzate, che non sono sempre disponibili nelle piccole strutture di progettazione italiane. Il controllo in opera è ancora poco praticato e erroneamente considerato svantaggioso. Affrontare il contrasto tra normativa scritta, applicazione pratica e controllo in opera, e fornire indicazioni sulle soluzioni tecniche più adottate, risulta un'operazione interessante e utile.

Di seguito, saranno analizzate tutte le tipologie di comfort a cui il presente Atlante si riferisce, partendo dal comfort termico, visivo e acustico, fino alla qualità dell'aria, con l'obiettivo di migliorare la qualità ambientale non solo degli edifici architettonici, ma più in generale dei comuni delle Madonie all'interno del Grande Geopark UNESCO.

Collesano; ©Luisa Lombardo, 2022

4.1 - Il comfort termico

Le proiezioni climatiche indicano che le ondate di calore estremo in estate potrebbero diventare più frequenti durante il XXI secolo a causa dei cambiamenti climatici, in particolare in Europa meridionale e sud-orientale (EEA Indicators, 2019).

Le coste mediterranee, che ospitano molte città e località densamente popolate, sono particolarmente vulnerabili all'aumento delle temperature estreme e alle ondate di calore. Queste aree sono esposte a un'alta radiazione solare, che durante l'estate può causare il surriscaldamento delle superfici esterne degli edifici (tetti e pareti) e dell'ambiente interno, con conseguente aumento della domanda di aria condizionata e del consumo di grandi quantità di energia. Una delle principali sfide per i paesi a clima caldo è realizzare il raffreddamento degli edifici mantenendo un basso impatto ambientale e ridotti costi energetici.

Le misure proposte comprendono modifiche al design interno e all'involucro degli edifici (l'interfaccia tra ambiente interno ed esterno), con l'obiettivo di migliorare il comfort termico e affrontare in particolare l'eccessiva calura durante le estati calde. Tali misure includono sia sistemi e tecniche tradizionali utilizzati per ridurre l'accumulo di calore (ad esempio, un corretto orientamento solare dell'edificio e una distribuzione ottimizzata degli spazi interni), sia approcci innovativi (ad esempio, nuovi materiali e tecniche di costruzione) e soluzioni *high-tech* (ad esempio, regolazione ottimizzata dei sistemi di aria condizionata e controllo automatico dell'umidità dell'aria).

Il controllo dell'accumulo e della dissipazione di calore, ottenuto senza ricorrere a dispositivi meccanici o elettrici, viene definito in letteratura "raffrescamento passivo". Il raffrescamento passivo include una vasta gamma di soluzioni specifiche finalizzate a prevenire l'accumulo diretto di calore solare, immagazzinare l'aria fresca all'interno dell'involucro dell'edificio, rimuovere il calore assorbito e rallentare il trasferimento di calore dall'ambiente esterno all'interno dell'edificio.

La progettazione tradizionale degli edifici nel Mediterraneo considera già le condizioni climatiche locali, integrando elementi di raffreddamento passivo per minimizzare il surriscaldamento e ridurre il consumo energetico estivo.

Questi elementi includono pareti spesse, orientamento in base alla brezza marina estiva, utilizzo di materiali lapidei per la loro capacità di accumulo termico e pareti dipinte di bianco. Pareti spesse o ben isolate, aperture adeguate, sistemi di schermatura e spazi esterni che offrono ombreggiatura e ventilazione naturale sono alcune delle soluzioni per aumentare il comfort termico e, al contempo, risparmiare energia.

Facciate e tetti, essendo gli elementi più esposti alla radiazione solare, rappresentano superfici importanti per lo scambio termico. La loro progettazione può contribuire a ridurre il surriscaldamento negli edifici senza perdita di energia.

Tra le soluzioni più adottate vi sono tetti e facciate verdi, verniciature riflettenti dei tetti e l'uso di tegole ventilate.

L'organizzazione degli spazi circostanti gli edifici, in particolare la distribuzione strategica degli alberi, può migliorare il flusso d'aria e ridurre l'impatto della radiazione solare, mitigando l'effetto isola di calore tipico delle aree urbane moderne.

Le soluzioni *high-tech* possono svolgere un ruolo cruciale. Queste comprendono sensori per il monitoraggio preciso delle condizioni termiche, che consentono una regolazione ottimale dell'aria condizionata e della ventilazione, e l'orientamento dei pannelli ombreggianti in base alle condizioni di insolazione in tempo reale. I sensori e i dispositivi digitali di regolazione termica possono anche essere integrati con sistemi di gestione della domanda, riducendo l'impatto del fabbisogno di raffreddamento durante i picchi di stress sul sistema elettrico.

Sono state esplorate nuove soluzioni per la regione mediterranea al fine di migliorare le prestazioni energetiche degli edifici attraverso lo sviluppo di tegole innovative, capaci di aumentare la ventilazione sottotegola. Sia gli edifici nuovi che quelli esistenti necessitano di adattamenti per affrontare l'aumento delle temperature e garantire un clima interno confortevole e salutare.

Le azioni di riqualificazione energetica degli edifici storici rappresentano una sfida significativa ma anche importanti opportunità di adattamento, considerando che costituiscono una parte considerevole del patrimonio edilizio in Europa (circa il 40% degli edifici è stato costruito prima del 1960; BPIE, 2011).

La Strategia Nazionale Italiana per l'Adattamento ai Cambiamenti Climatici (SNAC) raccomanda l'uso di standard climatici per i materiali di costruzione che limitino l'accumulo di calore negli edifici, incoraggiando soluzioni efficienti a livello energetico e sistemi di raffreddamento passivo per raggiungere il comfort termico desiderato con un ridotto consumo di energia. L'obiettivo è ridurre il consumo energetico e le emissioni di CO_2 a livello naziona-

le attraverso misure che migliorino la protezione termica e l'efficienza dei sistemi di riscaldamento, raffreddamento e ventilazione, optando per linee guida e opzioni per audit energetici, isolamento termico, edifici passivi e a basso impatto energetico e, infine, case intelligenti.

L'adozione di sistemi di raffreddamento sostenibili deve essere considerata sin dalle prime fasi di progettazione per ottimizzare il loro potenziale. I costi variano in base alla soluzione scelta e alla localizzazione del progetto e devono essere bilanciati con i benefici in termini di risparmio energetico per abitazioni, aziende e amministrazioni pubbliche.

Le soluzioni all'avanguardia possono comportare risparmi energetici sostanziali e, in alcuni casi, avvicinarsi a un uso netto di energia prossimo allo zero. Il settore edilizio contribuisce in misura significativa alle emissioni globali di gas serra, principalmente a causa del riscaldamento e del raffreddamento degli ambienti interni, essendo responsabile del 40% del consumo energetico totale in Europa.

Si stima che circa il 75% degli edifici dell'UE sia inefficiente dal punto di vista energetico, e recenti analisi da parte del BPIE (*Building Performance Institute Europe*) indicano che il 97,5% del parco immobiliare necessiti di aggiornamenti. Con la Direttiva 2018/844/EU entrata in vigore nel 2018, nuovi requisiti per la prestazione energetica degli edifici sono stati stabiliti, imponendo che tutti i nuovi edifici nell'UE, a partire dal 1° gennaio 2021, debbano utilizzare poca o nessuna energia per riscaldamento, raffreddamento e acqua calda. Pertanto, il miglioramento dell'efficienza energetica rappresenta l'approccio più efficace per ottimizzare le condizioni termiche negli edifici e contribuire alla mitigazione dei cambiamenti climatici.

I benefici in termini di comfort termico dipendono dalla soluzione implementata e sono specifici per ciascun sito, tenendo conto delle variabili climatiche (temperatura notturna e diurna, vento, umidità dell'aria) che devono essere considerate nella progettazione degli edifici. L'aumento degli spazi verdi in contesti urbani offre ulteriori benefici, tra cui il miglioramento della salute, la biodiversità urbana, le interazioni sociali e le migliorie estetiche, contribuendo anche alla mitigazione dei cambiamenti climatici.

I tempi di implementazione variano a seconda della misura specifica, da poche ore per l'installazione di tende e pannelli ombreggianti, fino a diversi mesi o addirittura anni per la progettazione e costruzione o rinnovo di un edificio adattato ai cambiamenti climatici.

La durata dipende dal tipo di intervento, spaziando da pochi anni fino alla vita residua dell'edificio. Secondo le stime del BPIE, il 75-90% degli edifici esistenti rimarrà in uso fino al 2050, mentre il tasso di costruzione è complessivamente basso.

Per rispettare gli impegni dell'Accordo di Parigi, è fondamentale per l'Europa conseguire un tasso di rinnovamento più rapido e profondo, in termini di risparmio energetico.

Gangi; ©Sicilia du me cori, 2024

4.2 - Il comfort visivo

Il comfort visivo riveste un'importanza fondamentale nel benessere abitativo e ha subito significativi cambiamenti nel corso dei secoli, influenzato dall'evoluzione dell'essere umano e dall'emergere di nuove invenzioni e scoperte tecnologiche.

La luce ha sempre rappresentato una fonte di calore, salute e felicità per l'essere umano. In passato, l'attività umana era fortemente condizionata dalla luce solare, poiché era possibile svolgere compiti solo durante le ore diurne, quando l'uomo poteva interagire con il mondo esterno grazie alla luce solare.

Con l'avvento del XIX secolo e l'invenzione della lampadina da parte di Thomas Edison, le abitudini quotidiane sono cambiate drasticamente. L'introduzione della luce artificiale ha permesso di estendere l'attività umana anche oltre le ore diurne, modificando significativamente il modo di progettare gli edifici.

Il comfort visivo si raggiunge attraverso un adeguato livello di illuminazione, una corretta distribuzione e direzione delle sorgenti luminose e una buona resa cromatica degli ambienti. Questi fattori contribuiscono a creare ambienti abitabili e funzionali, che consentono agli utenti di svolgere le loro attività quotidiane con efficienza.

Quando si parla di comfort visivo, è necessario considerare tre elementi principali: la quantità di luce, la qualità della luce e il tono della luce.

La quantità di luce in un'abitazione dipende dall'attenzione prestata alla progettazione del comfort visivo e varia in funzione delle attività che vi si svolgono. È essenziale evitare zone d'ombra o variazioni di intensità luminosa, poiché tali anomalie possono causare stress o affaticamento visivo.

La qualità della luce, che può essere distribuita in modo non uniforme, deve tenere conto delle diverse fonti di luce e delle sorgenti luminose. Infine, il tono della luce, che può variare in colore e intensità, deve essere valutato con attenzione.

Nella progettazione degli ambienti, è cruciale bilanciare la luce naturale con quella artificiale per creare spazi omogenei e confortevoli. I progettisti e gli occupanti possono verificare i seguenti fattori per assicurare un buon comfort visivo:

- **vista verso l'esterno:** avere delle finestre con vista esterna favorisce il benessere mentale degli abitanti, creando una connessione con l'ambiente esterno;
- **disponibilità di luce naturale:** è fondamentale garantire una quantità sufficiente di luce naturale all'interno degli ambienti chiusi per migliorare il comfort visivo;
- **distribuzione uniforme della luce:** la luce deve essere distribuita in modo omogeneo all'interno degli ambienti per evitare disturbi e disagi visivi;
- **combinazione di luce naturale e artificiale:** un'adeguata integrazione tra luce naturale e artificiale è cruciale per la salute fisica e mentale degli occupanti;
- **adeguatezza dell'illuminazione rispetto all'attività:** una luce insufficiente può generare stress e disagio visivo, pertanto l'illuminazione deve essere appropriata per le attività svolte;
- **evitare l'abbagliamento e i contrasti forti:** sebbene la luce naturale che penetra attraverso grandi vetrate possa migliorare l'umore, è importante evitare situazioni di abbagliamento;
- **design ed estetica:** un'abitazione con un design e uno stile che riflettano i gusti e le preferenze degli occupanti contribuisce a un senso di benessere generale.

Il comfort visivo è un aspetto cruciale della progettazione abitativa che deve essere attentamente considerato per garantire ambienti salutari e piacevoli.

Bompietro; ©Luisa Lombardo, 2023

4.3 - Il comfort acustico

Quando si decide di costruire un nuovo edificio o di ristrutturare uno esistente, la qualità acustica è un aspetto di primaria importanza da considerare. L'attenzione a questi aspetti è sempre più strettamente legata al comfort abitativo e alla crescente domanda di edifici di elevata qualità.

La normativa italiana in materia prevede il rispetto di precisi requisiti relativi alle prestazioni acustiche degli edifici, siano essi abitazioni private, attività commerciali, artigianali o industriali, sia di nuova costruzione che sottoposti a significative ristrutturazioni.

Il decreto di riferimento per i requisiti acustici passivi degli edifici è il DPCM 05/12/97.

Il rispetto dei requisiti acustici è cruciale non solo per conformarsi alle normative, ma anche per garantire il comfort dei futuri occupanti dell'immobile, e influisce direttamente sul valore economico dell'opera.

La qualità acustica deve essere considerata sin dalla fase progettuale e deve essere attentamente monitorata durante la costruzione per garantire risultati ottimali.

Per garantire un buon risultato acustico, è fondamentale partire da una fase progettuale ben strutturata. È essenziale prestare particolare attenzione alla messa in opera dei materiali e degli elementi che costituiscono l'edificio.

Errori comuni, come trascurare i serramenti o i piccoli dettagli, come i fori di aerazione della cucina, possono compromettere significativamente le prestazioni acustiche. Un progetto acustico deve considerare l'intero edificio, inclusi ambienti di servizio rumorosi, le caratteristiche acustiche dei vari elementi costitutivi, i serramenti, le pareti divisorie e gli impianti.

Fattori da considerare nella progettazione acustica

Partizioni interne e strutture murarie

- **serramenti:** è fondamentale selezionare infissi con adeguate proprietà fonoisolanti. Se le prestazioni dei serramenti non sono note in fase di progettazione, devono essere calcolate e fornite da un tecnico acustico. La posa in opera dei serramenti deve garantire una sigillatura accurata e una corretta regolazione;
- **porte e portoncini di ingresso:** è essenziale verificare il potere fonoisolante di porte e portoncini, nonché la loro sigillatura e regolazione per evitare aperture residue e garantire un isolamento ottimale;
- **fori di ventilazione delle cucine:** i dispositivi di ventilazione devono essere certificati e valutati da un tecnico competente in acustica.

Pareti divisorie

La selezione di materiali laterizi con buone proprietà di isolamento acustico deve essere accompagnata da una messa in opera adeguata.

È cruciale riempire tutti i giunti con malta, sigillare i punti di connessione nelle pareti divisorie, e chiudere eventuali tracce per evitare ponti acustici.

Pareti divisorie tra unità abitative differenti

Il rumore può essere trasmesso attraverso le pareti sia per via aerea che strutturale. È importante installare fasce tagliamuro acustiche e creare discontinuità nella copertura per evitare ponti acustici. È preferibile evitare nicchie o tracce per impianti nelle pareti divisorie tra unità abitative.

Strutture di orizzontamento

I solai devono essere privi di discontinuità per evitare ponti acustici. L'uso di pavimenti galleggianti con elementi elastici, come i pannelli anticalpestio, aiuta a smorzare le vibrazioni e i rumori impattivi.

È essenziale evitare continuità strutturale tra il pavimento e le pareti e garantire una corretta posa della fascia perimetrale.

Impianti

Gli impianti devono essere gestiti con la massima attenzione per rispettare i limiti di emissione. Gli impianti a funzionamento continuo e discontinuo devono soddisfare requisiti specifici per garantire un'adeguata prestazione acustica.

Una progettazione e una messa in opera accurata sono fondamentali per raggiungere i requisiti acustici minimi di legge e garantire il comfort abitativo. Un'attenta considerazione di tutti gli aspetti acustici durante il processo di costruzione è essenziale per ottenere risultati ottimali e prevenire problematiche future.

4.4 - La qualità dell'aria

Il fattore più significativo per il comfort climatico all'interno di un edificio è la qualità dell'aria, che comprende la sua purezza, temperatura e umidità. In ambienti abitati, la qualità dell'aria tende a deteriorarsi: la percentuale di ossigeno diminuisce a causa della respirazione, mentre quella di biossido di carbonio (CO_2) aumenta; cresce anche l'umidità dell'aria e si sviluppano odori sgradevoli.

Quando la concentrazione di CO_2 supera lo 0,07%, l'aria è considerata esausta. In tali condizioni, la diminuzione della concentrazione di ossigeno può causare sonnolenza e cefalea.

I principali fattori che compromettono la qualità dell'aria includono:

- biossido di carbonio (CO_2);
- vapore acqueo (afa);
- sostanze maleodoranti;
- gas e vapori;
- microrganismi;
- radon.

Per garantire un ambiente salubre, è essenziale mantenere una buona ventilazione degli ambienti chiusi. La ventilazione fornisce nuovo ossigeno, rimuove l'aria esausta, l'umidità e altri inquinanti. Il ricambio dell'aria deve essere proporzionato al numero di persone presenti e al tipo di attività svolta.

Le esigenze di aria fresca per persona sono le seguenti:

- lavoro sedentario: 20-40 m^3/h;
- lavoro non sedentario: 40-60 m^3/h;
- lavoro fisico pesante: > 65 m^3/h.

La questione della qualità dell'aria diventa particolarmente rilevante durante il periodo invernale, quando si tende a non aprire le finestre per conservare il calore.

Negli edifici ad alta efficienza energetica, la ventilazione avviene meccanicamente. La ventilazione meccanica consente il controllo della qualità dell'aria, fornisce la quantità necessaria di aria fresca e recupera anche il calore dall'aria esausta.

In questo modo, il ricambio d'aria è garantito e le perdite di calore sono ridotte al minimo.

Tutti gli edifici a basso consumo energetico sono attualmente equipaggiati con impianti di ventilazione meccanica. È, pertanto, fondamentale prestare attenzione anche al dimensionamento delle finestre e considerare l'inserimento di piante d'appartamento, che possono contribuire a migliorare ulteriormente la qualità dell'aria.

Campagne siciliane; ©Giovanni Coste, 2023

Autostrada Madonie; ©Luisa Lombardo, 2022

4.5 - La qualità ambientale

L'importanza di migliorare la qualità ambientale degli edifici è sempre più evidente, poiché le preoccupazioni ambientali crescono e i cambiamenti climatici rappresentano una minaccia globale.

Gli edifici contribuiscono in modo significativo alle emissioni di gas serra e hanno un impatto sull'ambiente circostante, sulla salute umana e sul benessere. Ecco alcune strategie chiave per migliorare la qualità ambientale degli edifici:

- **ridurre il consumo energetico** è fondamentale per ridurre l'impatto ambientale degli edifici;
- l'isolamento termico, l'installazione di finestre ad alte prestazioni e l'adozione di sistemi di riscaldamento, raffreddamento e illuminazione efficienti possono ridurre significativamente i consumi energetici;
- l'adozione di **fonti di energia rinnovabile** come pannelli solari o eolici può contribuire a coprire parte o la totalità dei bisogni energetici di un edificio.

Questo non solo riduce l'impatto ambientale, ma può anche ridurre i costi a lungo termine. La scelta di materiali da costruzione sostenibili, come legno o materiali riciclati, contribuisce a ridurre l'impatto ambientale durante la costruzione e il ciclo di vita dell'edificio. La raccolta delle acque piovane può essere utilizzata per l'irrigazione dei giardini o il raffreddamento degli edifici, riducendo la dipendenza dai sistemi idrici tradizionali.

- **ventilazione e qualità dell'aria interna:** un buon sistema di ventilazione e la scelta di materiali privi di emissioni nocive contribuiscono a migliorare la qualità dell'aria interna, creando un ambiente più sano per gli occupanti.

Il design bioclimatico tiene conto delle condizioni climatiche locali per massimizzare l'efficienza energetica e il comfort termico. Questo può includere la posizione ottimale delle finestre, l'orientamento dell'edificio e l'uso di elementi passivi come la luce solare e l'ombreggiatura naturale. L'automazione e l'uso di tecnologie intelligenti, come i sistemi di gestione energetica, consentono un controllo più preciso dei consumi e una maggiore efficienza. Ricerche e adesioni a certificazioni ambientali come LEED (*Leadership in Energy and Environmental Design*) possono aiutare a garantire che un edificio rispetti standard ambientali rigorosi.

Educare gli occupanti sull'importanza di comportamenti sostenibili, come spegnere luci e dispositivi quando non sono necessari, può contribuire a ridurre il consumo energetico complessivo dell'edificio. Nel caso di aree urbane, la rigenerazione di spazi già esistenti può ridurre la necessità di nuove costruzioni e favorire un uso sostenibile del territorio. Migliorare la qualità ambientale degli edifici richiede un impegno continuo da parte dei progettisti, dei costruttori e degli occupanti. L'adozione di queste strategie può contribuire a ridurre l'impatto ambientale degli edifici, promuovere la sostenibilità e migliorare la qualità della vita delle persone.

SCHEDE ILLUSTRATIVE

Passaggi madoniti; © Tania Meli, 2022

Le schede illustrative all'interno dell'Atlante sono progettate per offrire informazioni chiare e pratiche ai tecnici, alle amministrazioni, alle imprese e ai cittadini coinvolti nel processo di conservazione e recupero del patrimonio.

Ogni scheda rappresenta una soluzione tecnologica specifica, considerando le esigenze uniche delle Madonie. Le informazioni contenute includono:

- **descrizione della tecnologia:** ogni scheda inizia con una descrizione esaustiva della tecnologia in questione. Questo fornisce una panoramica completa delle funzionalità e dei benefici.
- **compatibilità con il patrimonio:** le schede illustrano come la tecnologia sia compatibile con l'architettura e la storia delle Madonie, evitando impatti negativi sulle caratteristiche storiche e culturali.
- **applicazioni:** ogni tecnologia ha diverse applicazioni specifiche per il recupero del patrimonio, come il restauro di edifici antichi, la conservazione dei manufatti o l'efficiente gestione delle risorse idriche.
- **vantaggi ambientali:** le schede illustrative evidenziano anche i vantaggi ambientali delle tecnologie proposte, promuovendo la sostenibilità e la riduzione dell'impatto ambientale.
- **esempi di utilizzo:** le schede includono esempi concreti di progetti o applicazioni in cui la tecnologia è stata impiegata con successo nelle Madonie o in contesti simili.

L'Atlante delle Soluzioni Tecnologiche per il Recupero del Patrimonio delle Madonie è uno strumento prezioso che offre numerosi benefici:

- **conservazione del patrimonio:** fornisce strumenti per conservare il ricco patrimonio delle Madonie, garantendo che le nuove tecnologie non compromettano l'autenticità storica.
- **sostenibilità ambientale:** Promuove l'uso di tecnologie sostenibili che contribuiscono alla conservazione dell'ambiente naturale delle Madonie.
- **orientamento per le decisioni:** Assiste tecnici, amministrazioni, imprese e cittadini nelle scelte consapevoli e informate per il recupero del patrimonio.
- **condivisione di conoscenze:** Favorisce lo scambio di conoscenze tra professionisti, contribuendo all'elevazione delle competenze locali nel settore del recupero del patrimonio.

NB: Le seguenti schede illustrative affrontano soluzioni tecnologiche per la conservazione e la protezione dei centri e dei nuclei storici e dell'architettura rurale ai fini paesaggistici e sulla qualità dell'intervento contemporaneo per la riqualificazione degli edifici e dei nuclei urbani delle aree interne del Parco delle Madonie, ritendo tali tematiche strettamente interconnesse, se non indissolubili, rispetto a quelle dei beni architettonici sottoposti a tutela.

Il documento redatto pertanto non fornisce soluzioni pronte all'uso, né prescrive metodologie a carattere vincolante, in considerazione delle peculiarità dei beni interessati, della naturale evoluzione nel tempo delle tecnologie adoperate e dei futuri aggiornamenti normativi, ma può solo guidare l'intelligenza e la sensibilità del personale e dei progettisti per il raggiungimento istituzionale primario della protezione e conservazione del patrimonio culturale.

Caccamo ©Quelli del Parco delle Madonie, 2023

Caltavuturo; ©Luisa Lombardo, 2023

AMBITO DI APPLICAZIONE

In questo paragrafo sono identificate tutte le figure con ruolo attivo o potenziale nella realizzazione delle misure delineate nell'Atlante.
Questi soggetti sono associati all'effettiva attuazione e all'erogazione delle misure stesse, contribuendo a definire il processo di implementazione:

• UTENTE
È la persona che utilizza l'edificio e ha bisogno di migliorare le condizioni di comfort. Può essere il proprietario stesso, l'inquilino o un dipendente.

• PROPRIETARIO
Proprietario dell'immobile.

• LOCATORE
È la persona che, con un contratto di locazione, abita o utilizza l'immobile oi locali. È normale che le bollette di luce, acqua e/o gas siano da saldare. Ci sono misure che si possono implementare direttamente, ma per altre si avrà bisogno dell'autorizzazione del proprietario.

• CONDOMINIO
Formato da tutti i proprietari. Per l'attuazione di alcune misure può essere necessario il consenso o l'approvazione della comunità dei condomini.

• TECNICO e LIBERO PROFESSIONISTA abilitato alla progettazione architettonica
Professionista che interviene quando si necessita di un progetto tecnico per impianti e certificati. Può fungere da consulente o da facilitatore.

• COSTRUTTORE
È colui che, nei lavori di risanamento, esegue il progetto. Apporta i materiali e i prodotti definitivi al progetto e le modifiche necessarie per il progetto.

• INSTALLATORE
Professionista o impresa abilitata ad eseguire l'installazione di acqua, luce, gas, ecc.

• TECNICO SPECIALIZZATO
Alcune misure richiedono un installatore specializzato, che abbia conoscenza ed esperienza nell'implementazione di una determinata apparecchiatura, sistema, ecc.

• AMMINISTRAZIONE COMUNALE
Verificare se ha misurato la possibilità di adeguamenti economici, sovvenzioni e se può concedere permessi o licenze per la realizzazione del progetto.

• RESPONSABILE DELLA MANUTENZIONE
È la persona responsabile del corretto funzionamento degli impianti e delle infrastrutture dell'edificio. Nel caso in cui tale nomina non esista, il manutentore viene scelto direttamente dal locatario o proprietario.

In. 00 NOME DELLA SOLUZIONE INDIVIDUATA

Numero della soluzione individuata e descrizione

Categoria di riferimento

PRINCIPIO DI FUNZIONAMENTO

Il presente paragrafo esplicita in che modo la soluzione tecnologica individuata interagisce con il costruito

APPLICABILITÀ

Il presente paragrafo esplicita in che modo può essere integrato il sistema rispetto al costruito

VANTAGGI / SVANTAGGI / RISCHI

Il presente paragrafo esplicita i possibili vantaggi, svantaggi e rischi dell'applicazione della soluzione tecnologica individuata

SINERGIE E INTERAZIONI

Il presente paragrafo esplicita i possibili vantaggi, svantaggi e rischi presenti nell'applicazione della soluzione tecnologica individuata

Alcune schede tecniche sono corredate di un alert, che segnala la compatibilità dell'intervento con il contesto:
Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.
Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

NORMATIVA DI RIFERIMENTO

In questo box verrà inserita la normativa afferente alla soluzione tecnologica individuata

Il box individua se l'intervento riguarda l'edificio o l'intero ambito urbano

ELEMENTO TECNOLOGICO

tipologia di applicazione

Il box individua se la soluzione scelta è un adeguamento superficiale o un'integrazione volumetrica

COMPATIBILITÀ : B - M - A
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B - M - A

Il box individua quanto la soluzione tecnologica individuata è compatibile, reversibile o invasiva attraverso i parametri BASSA - MEDIA - ALTA

AZIONI indicare l'azione che svolge

Il box individua le azioni svolte dalla soluzione scelta

SOLUZIONE CONFORME

Il box individua, qualora presenti, disegni tecnici, approfondimenti tecnologici, disegni e specifiche tecniche

MATERIALI

SIMBOLO MATERIALE

NOME MATERIALE

COLORI

PROTOTIPO COLORE

NOME COLORE

La presente scheda raccoglie gli esempi applicativi relativi alla soluzione tecnologica individuata nella scheda precedente.

NOME

FOTO

LOCALIZZAZIONE

MAPPA

TIPOLOGIA DI INTERVENTO

LOCALIZZAZIONE

PROGETTISTI

DESTINAZIONE

DATA IMPIANTO ORIGINALE

ANNO INTERVENTO

COSTO INTERVENTO

DESCRIZIONE INTERVENTO

Specifiche tecniche del caso studio individutato

DATI CLIMATICI

Zona climatica
Temperature massime medie (°C)
Venti prevalenti

Il box fornisce i dati relativi all'ambito territoriale di riferimento

POSIZIONAMENTO

PICCOLA / GRANDE CITTÀ

TESSUTO

STORICO / AMPLIAMENTO

USO

PUBBLICO / PRIVATO

TIPOLOGIA ANTE

PUBBLICO / PRIVATO

MORFOLOGIA

PROMISCUITÀ

ISOLATO / ADDOSSATO

TIPOLOGIA POST

PUBBLICO / PRIVATO

CARATTERISTICHE ENERGETICHE

ANTE

POST

RISPARMIO

INTERVENTI SUL MANUFATTO ARCHITETTONICO

Foto dell'intervento tipo

Individua nel dettaglio la specifica tecnica da esaminare

	B	M	A
unità tecnologica			
invadenza			
reversibilità			
compatibilità			
tipo di intervento			
materiale			

strategie

- contenimento termico
- accumulo termico
- captazione luminosa
- schermatura
- dispersione termica

	B	M	A
unità tecnologica			
invadenza			
reversibilità			
compatibilità			
tipo di intervento			
materiale			

strategie

- contenimento termico
- accumulo termico
- captazione luminosa
- schermatura
- dispersione termica

	B	M	A
unità tecnologica			
invadenza			
reversibilità			
compatibilità			
tipo di intervento			
materiale			

strategie

- contenimento termico
- accumulo termico
- captazione luminosa
- schermatura
- dispersione termica

Individuazione della categoria afferente

ESEMPI PRESENTI NEL TERRITORIO

Inserimento di una foto esemplificativa della soluzione tecnologica attualmente presente nel territorio

Luogo

Individuazione del luogo in cui è ubicato

Inserimento di una foto esemplificativa della soluzione tecnologica attualmente presente nel territorio

Luogo

Individuazione del luogo in cui è ubicato

Inserimento di una foto esemplificativa della soluzione tecnologica attualmente presente nel territorio

Luogo

Individuazione del luogo in cui è ubicato

Inserimento di una foto esemplificativa della soluzione tecnologica attualmente presente nel territorio

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Inserimento di una foto esemplificativa della soluzione tecnologica attualmente presente nel territorio

Luogo

Individuazione del luogo in cui è ubicato

Inserimento di una foto esemplificativa della soluzione tecnologica attualmente presente nel territorio

Luogo

Individuazione del luogo in cui è ubicato

MISURE PER L'UTENTE

In aggiunta alle schede illustrative sulle soluzioni tecniche identificate, questo manuale ha come obiettivo promuovere l'adozione di buone pratiche nell'ambito della vita quotidiana, con l'obiettivo di favorire il risparmio energetico all'interno degli edifici e di conseguenza, la riduzione dei costi energetici. Pertanto, è fondamentale considerare anche le seguenti sezioni come componenti essenziali dell'Atlante:

Polizzi Generosa; ©Luisa Lombardo, 2023

S - Salute e Comfort

- Temperatura e umidità ottimali
- Ventilazione e ricambio d'aria
- Materiali da costruzione
- Igiene e sanificazione
- Isolamento acustico e vibrazioni
- Condizionamento acustico
- Illuminazione naturale
- Illuminazione artificiale
- Fornitura elettrica
- Radiazioni elettromagnetiche a bassa frequenza
- Radiazioni elettromagnetiche ad alta frequenza

P - Misure Passive

- Tetti verdi
- Isolamento della copertura
- Isolamento esterno
- Isolamento interno
- Eliminazione dei ponti termici
- Riduzione delle infiltrazioni
- Sostituzione dei vetri
- Sostituzione degli infissi
- Schermature solari
- Muro di Trombe
- Ventilazione naturale
- Coperture e facciate ventilate

A - Misure Attive

- Sistemi di misurazione e controllo
- Centralizzazione dei contatori
- Compensazione energetica
- Soluzioni per l'efficienza dell'illuminazione
- Ottimizzazione dell'uso dell'illuminazione
- Cogenerazione elettrica e termica
- Generazione termica mediante aerotermia
- Produzione di energia elettrica da fonti rinnovabili
- Prod. di energia elettrica con energie rinnovabili
- Energia solare-termica per ACS e riscaldamento
- Recupero di calore
- Miglioramento dell'efficienza dei sistemi di climatizzazione
- Soluzioni alternative per la climatizzazione
- Uso razionale dell'aria condizionata
- Centralizzazione degli impianti di climatizzazione
- Teleriscaldamento e teleraffrescamento
- Sistemi di distribuzione energetica efficienti
- Eliminazione dello stand-by
- Manutenzione dei grandi elettrodomestici
- Serbatoi doppi
- Aeratori e riduttori di flusso d'acqua

ANALISI QUANTITATIVA

I criteri generali dell'analisi quantitativa sono spiegati tramite icone, ciascuna rappresentante una delle variabili considerate. "Maggiore è il riempimento della misura, più alto è il grado di raccomandazione."

Salute

La variabile "Salute" valuta come influiscono le misurazioni delle utenze dell'edificio in relazione alla qualità dell'aria interna, limitando gli inquinanti, al comfort igrotermico, assicurando temperature e umidità idonee alla salute, alla qualità della luce, con una predominanza di luce naturale rispetto a quella artificiale nei bagni curativi, alla qualità acustica, limitando rumore e vibrazioni nei bagni termali, e alla qualità CEM, riducendo le radiazioni elettromagnetiche ad alta e bassa frequenza.

Comfort

La variabile "Comfort" valuta l'effetto che la misura in miglioramento ha sul benessere degli utenti dell'edificio, considerando vari aspetti: il comfort igrometrico, assicurando un'umidità relativa compresa tra il 40% e il 60%; il comfort termico, mantenendo una temperatura ideale per il benessere; il comfort acustico, limitando rumori e vibrazioni; il comfort luminoso, garantendo una predominanza di luce naturale rispetto a quella artificiale; e il comfort cognitivo, promuovendo una percezione emotiva positiva e il benessere psicologico.

Risparmio energetico o risparmio idrico

La variabile di risparmio energetico valuta l'impatto dell'applicazione di una determinata misura sulla riduzione della domanda di energia, in relazione alle misure passive, e sul consumo energetico, in relazione alle misure attive. In questa sezione, si esaminerà il risparmio energetico ottenuto attraverso l'applicazione del provvedimento, partendo da una base di partenza inefficiente. È importante notare che il risparmio energetico non deve essere confuso con l'efficienza energetica. La sostituzione delle fonti energetiche convenzionali con fonti rinnovabili sarà considerata come risparmio energetico. La variabile risparmio idrico, invece, indica l'efficacia della misura nel ridurre i consumi idrici. Se la riduzione dei consumi idrici include anche una riduzione dell'acqua calda, si otterrà un risparmio energetico. I livelli di risparmio energetico sono categorizzati come segue: fino al 10%, tra l'11% e il 20%, tra il 21% e il 40%, tra il 41% e il 70%, e oltre il 71%.

Facilità di attuazione

La variabile della facilità di attuazione è correlata alla semplicità di esecuzione della misura, considerando sia la complessità delle soluzioni tecniche necessarie sia il numero di agenti coinvolti nella sua implementazione. I livelli di facilità di attuazione includono scenari in cui è necessario elaborare un progetto, richiedere una licenza e ottenere un accordo con i vicini; situazioni in cui è sufficiente preparare un progetto e richiedere una licenza; casi in cui è necessario assumere un team di esperti e il processo richiede alcune settimane; contesti in cui è necessario un team di esperti e il processo viene completato in un giorno; e infine situazioni in cui non è richiesta alcuna competenza specialistica e la misura può essere eseguita autonomamente.

Ammortamento

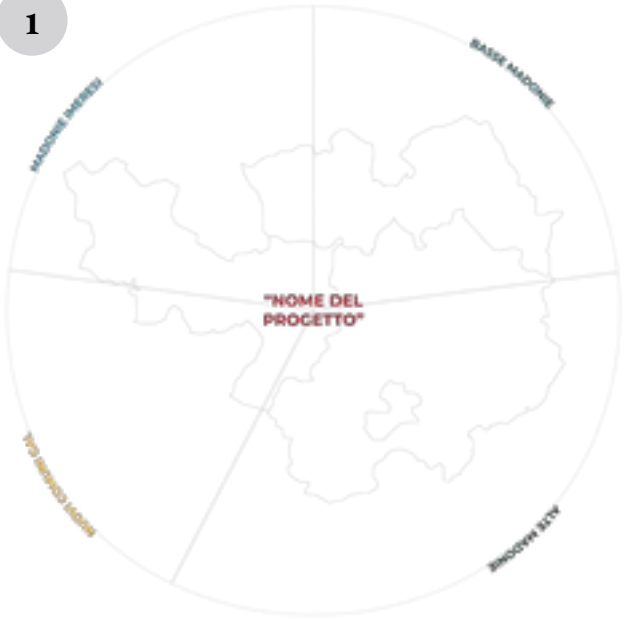
La variabile di ammortamento si riferisce al tempo necessario per recuperare l'investimento iniziale grazie al risparmio economico generato dall'applicazione della misura. Un buon ammortamento si verifica quando il ritorno sull'investimento avviene nel minor tempo possibile. I tempi di ammortamento possono variare come segue: oltre 25 anni, tra i 16 e i 25 anni, tra i 6 e i 15 anni, tra 1 e 5 anni, oppure in meno di 1 anno.

Rispetto ambientale

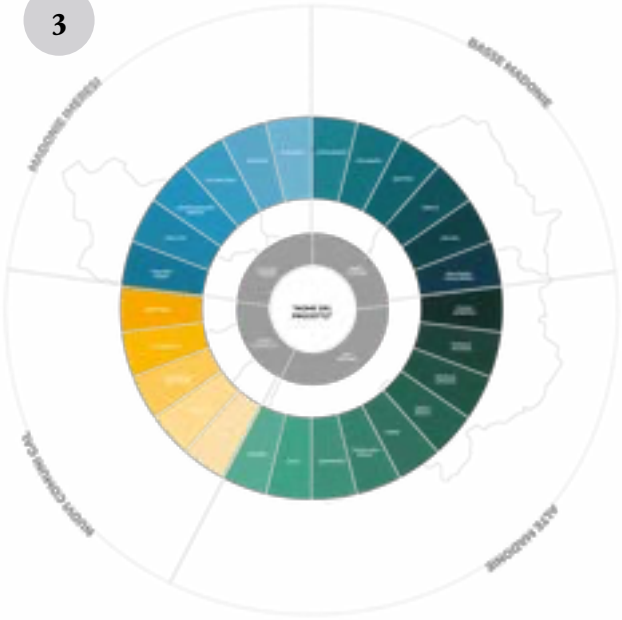
La variabile rispetto ambientale fornisce un'indicazione dell'impatto globale dell'applicazione della misura, considerato lungo tutto il suo ciclo di vita. La valutazione per questo criterio è di natura qualitativa e ha l'obiettivo di orientare l'utente della guida nella differenziazione dell'entità dell'impatto ambientale tra le diverse soluzioni riabilitative. Gli aspetti considerati includono la conservazione delle risorse naturali, l'uso di materiali riutilizzabili e/o riciclabili, l'impiego di materiali locali, la riduzione delle emissioni di CO_2 durante l'attuazione della misura e una vita media superiore a 25 anni.

Soluzionen

1


"NOME DEL PROGETTO"
BASSE MADONIE
ALTE MADONIE

3


BASSE MADONIE
ALTE MADONIE

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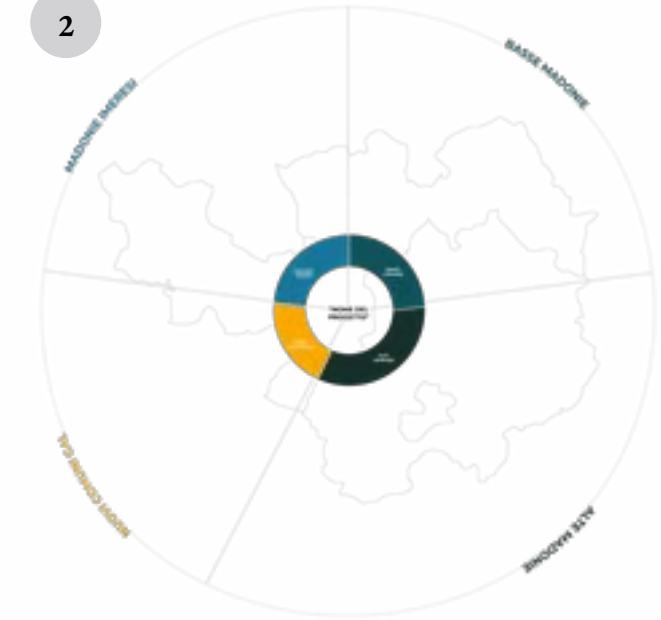
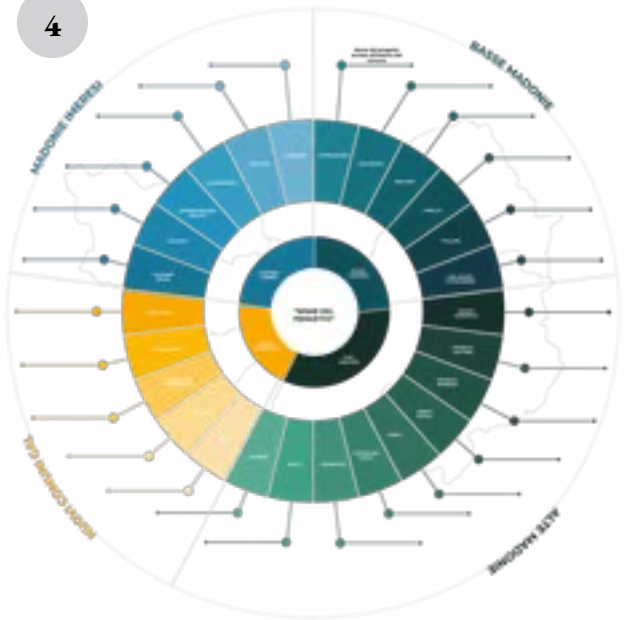

BASSE MADONIE
ALTE MADONIE

4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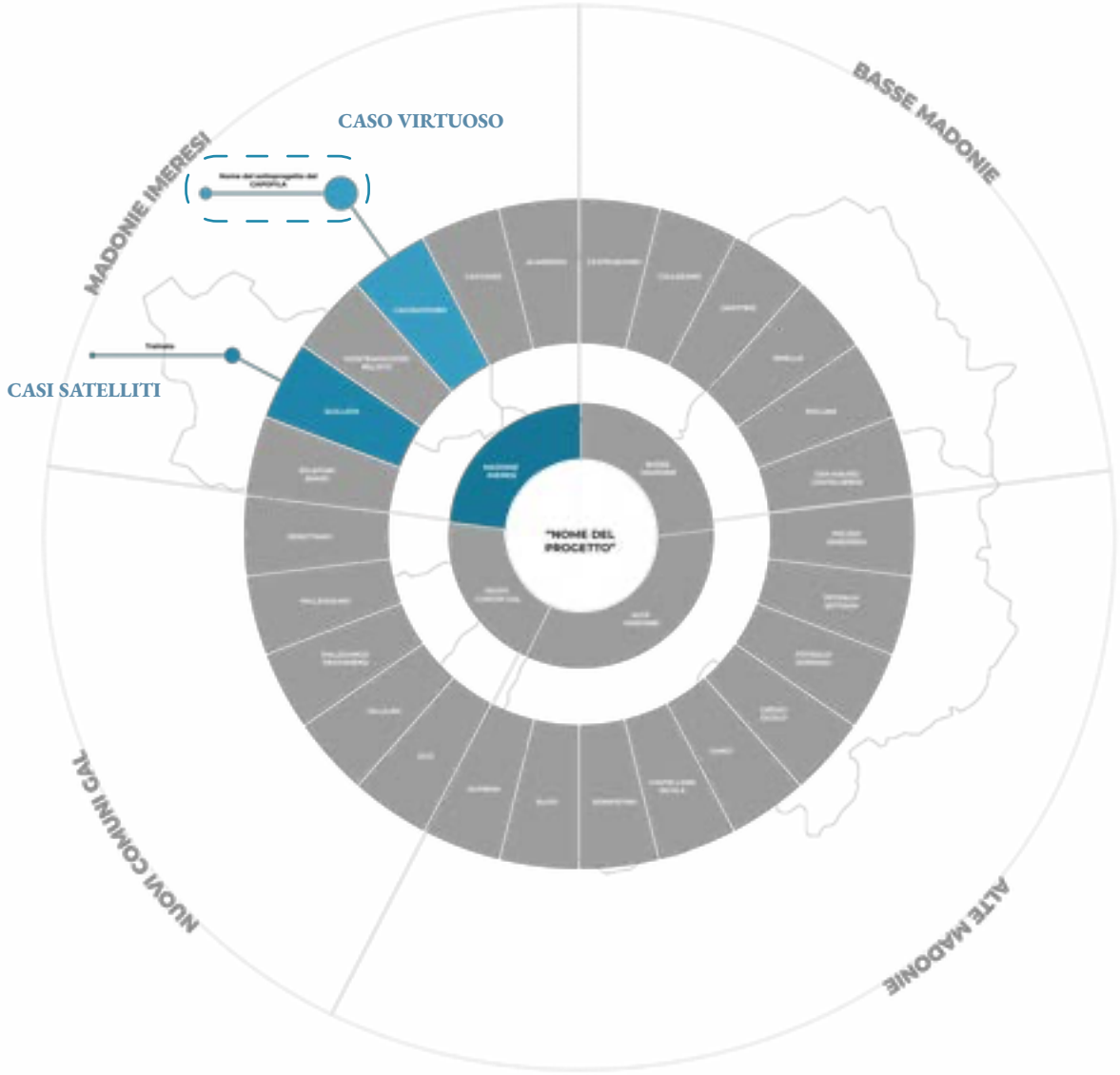
5

Le **mappe di rete** sono state sviluppate per rappresentare in modo chiaro le strategie intelligenti implementate sul territorio. Queste mappe, denominate "mappe di rete", offrono una rappresentazione visiva della situazione attuale dei Comuni delle Madonie, includendo sia le strategie già adottate che quelle potenzialmente estendibili all'intero territorio in esame. L'analisi ha coinvolto i comuni dal comprensorio, distinguendo tra quelli già attivi nelle strategie e quelli ancora non inclusi.

È stata inoltre condotta una valutazione dei comuni recentemente integrati nel Gruppo di Azione Locale (GAL), anche se non facenti parte dell'area del Parco delle Madonie. Tra questi, i Comuni di Vallelunga Pratameno, Valledolmo, Resuttano, Villalba e Alia hanno assunto un ruolo rilevante in progetti strategici volti allo sviluppo delle aree interne, con particolare enfasi su Valledolmo.

Le mappe di rete si configurano come strumenti efficaci per monitorare i progetti in corso nelle Madonie, evidenziando visivamente i comuni coinvolti e quelli non ancora partecipanti. Il progetto oggetto dell'analisi è posizionato al centro della mappa (*Fig. 1*), con una suddivisione del territorio tra Alte e Basse Madonie e Madonie Imeresi, seguendo la classificazione SNAI (*Fig. 2*). Una sezione dedicata elenca i 26 comuni coinvolti (*Fig. 3*), fornendo una chiara indicazione visiva della loro partecipazione. Le appendici connesse al cerchio principale forniscono informazioni dettagliate sui progetti che hanno avuto impatto sui singoli comuni (*Fig. 4*).

Delineano chiaramente le strategie da implementare per contribuire efficacemente alla realizzazione della rete "smart", con l'obiettivo di coinvolgere il maggior numero possibile di comuni.



Per garantire una comprensione più approfondita e dettagliata delle soluzioni analizzate, l'Atlante è stato suddiviso in un totale di dodici categorie distinte.

Questa suddivisione è finalizzata a una chiara differenziazione delle tematiche trattate e delle applicazioni specifiche che riguardano i vari ambiti d'intervento. Tale articolazione permette di affrontare con maggiore precisione le problematiche e le soluzioni in un contesto diversificato, offrendo un quadro completo e organico delle opportunità esistenti.

La scelta di strutturare l'Atlante in queste categorie non è stata casuale, ma deriva da un accurato e approfondito studio del Piano Nazionale di Ripresa e Resilienza (PNRR). Tale studio ha consentito di individuare nuovi e importanti obiettivi che i piccoli comuni, sia a livello nazionale che europeo, sono chiamati a raggiungere.

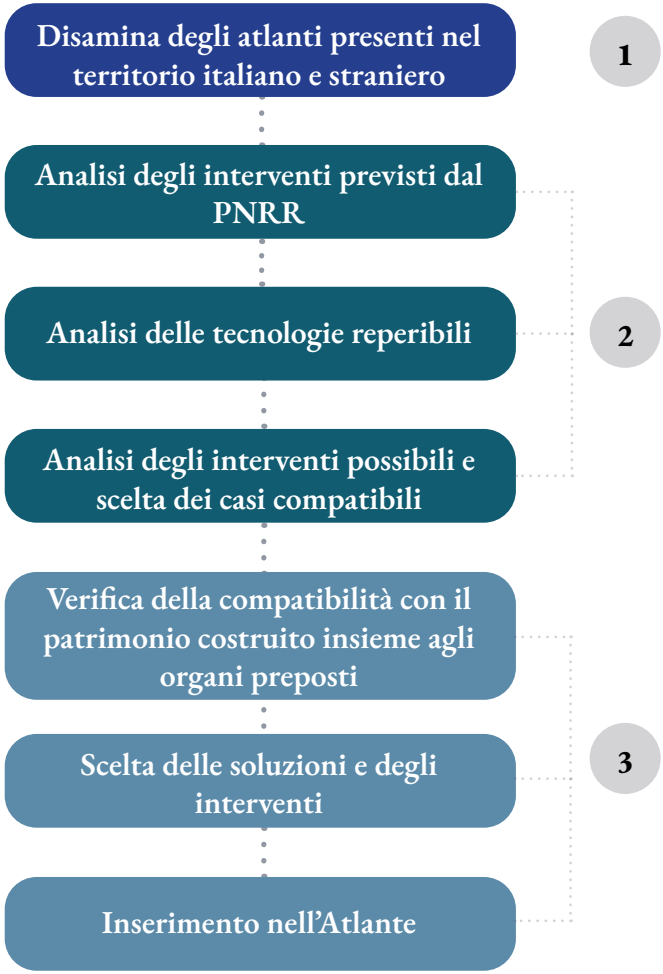
L'intento sotteso a questa operazione è quello di rendere le scelte quanto più condivise e uniformi a livello europeo, favorendo un allineamento con le direttive comunitarie e garantendo una coerenza generale tra le varie azioni.

La definizione di queste categorie riveste un ruolo particolarmente significativo, poiché è essenziale per ribadire e rafforzare il concetto di "smart village". Questo concetto si configura come un modello innovativo che integra in maniera armoniosa la tecnologia, le tradizioni locali e l'innovazione, con l'obiettivo di promuovere uno sviluppo sostenibile e intelligente. In questo quadro, viene posta particolare attenzione alla compatibilità delle soluzioni proposte, affinché possano essere implementate senza compromettere l'equilibrio e l'identità del territorio. L'adozione di queste soluzioni, infatti, deve avvenire in sintonia con le peculiarità e le esigenze locali, garantendo il rispetto delle caratteristiche del patrimonio storico e culturale.

Nel dettaglio, lo sviluppo della fase degli Smart Villages prevede una serie di passaggi fondamentali. Come illustrato nella Tab. 1, il processo inizia con una prima fase di analisi approfondita degli Atlanti già esistenti all'interno del territorio delle Madonie, al fine di ottenere una mappatura accurata delle risorse e delle potenzialità presenti.

Successivamente, la seconda fase è dedicata a un'attenta valutazione degli interventi previsti dal PNRR, nonché all'analisi delle tecnologie disponibili sul mercato e degli interventi possibili e compatibili con il contesto locale. Questa fase è cruciale per individuare soluzioni che possano rispondere in maniera efficace alle esigenze del territorio, con un occhio di riguardo alla sostenibilità e all'innovazione.

Infine, la terza fase del processo prevede la verifica della compatibilità delle soluzioni proposte con il patrimonio edilizio esistente, attraverso una stretta collaborazione con gli organi competenti, in particolare con la Soprintendenza ai Beni Culturali. In questa fase, si procede alla scelta delle soluzioni più appropriate, tenendo conto sia delle esigenze di conservazione del patrimonio costruito sia delle opportunità di innovazione tecnologica.
Una volta selezionate le soluzioni e gli interventi da realizzare, questi vengono poi integrati all'interno dell'Atlante, arricchendone il contenuto e fornendo una guida concreta per l'attuazione delle politiche di sviluppo.



Tab. 1 | Metodologia per la stesura dell'Atlante,
©Luisa Lombardo, 2023

CATEGORIE

Petralia Soprana; ©Salvatore Fiume, 2023

L'Atlante elaborato rappresenta uno strumento strategico che ora viene articolato in dodici categorie principali.

Questa suddivisione è il risultato di un'analisi approfondita degli incentivi previsti dal Piano Nazionale di Ripresa e Resilienza (PNRR) e di una valutazione dettagliata condotta sui comuni, con l'obiettivo di identificare soluzioni tecnologiche mirate a ridurre l'impatto ambientale e a migliorare le condizioni di vita degli abitanti.

Ogni categoria è stata selezionata e definita per rispondere in modo specifico alle esigenze locali e alle opportunità di sviluppo sostenibile per i territori delle Madonie.

Le dodici categorie dell'Atlante sono:

- **efficientamento energetico:** questa sezione si concentra sull'ottimizzazione dei consumi energetici attraverso interventi e tecnologie che permettano una gestione più efficiente delle risorse energetiche. il fine è ridurre i consumi e le emissioni di co_2, migliorando al contempo il comfort e l'efficienza degli edifici;
- **vulnerabilità sismica:** questa categoria analizza le misure necessarie per rafforzare la sicurezza sismica degli edifici e delle infrastrutture, riducendo il rischio di danni in caso di eventi sismici. include soluzioni di rinforzo strutturale e aggiornamenti normativi;
- **recupero idrico:** si focalizza sulla gestione e riutilizzo delle risorse idriche, con soluzioni innovative per il recupero e il riutilizzo delle acque piovane e grigie, così come per l'ottimizzazione dei consumi idrici;
- **accessibilità:** esamina le misure per migliorare l'accessibilità e la fruibilità degli spazi pubblici e privati, garantendo l'inclusione di persone con disabilità e promuovendo un ambiente urbano più accogliente e funzionale;
- **comunità energetiche:** analizza le opportunità e le modalità di creazione e gestione di comunità energetiche locali, che permettano una produzione e un consumo condivisi di energia rinnovabile, favorendo l'autosufficienza energetica e la sostenibilità;
- **decoro urbano:** questa categoria riguarda gli interventi per migliorare l'aspetto estetico e la qualità dell'ambiente urbano, promuovendo la rigenerazione degli spazi pubblici e l'integrazione di elementi naturali e di design sostenibile;
- **adeguamento acustico:** si occupa delle soluzioni per il controllo e la riduzione del rumore ambientale, con particolare attenzione agli interventi necessari per migliorare il comfort acustico in spazi residenziali e pubblici;
- **digitalizzazione:** esplora le tecnologie e le soluzioni digitali che possono essere adottate per migliorare l'efficienza dei servizi pubblici, facilitare l'accesso alle informazioni e ottimizzare la gestione delle risorse;
- **cooperative di comunità:** analizza i modelli di cooperazione tra cittadini per gestire risorse e servizi comuni, favorendo iniziative collettive che possano contribuire al benessere economico e sociale delle comunità locali;
- **governance:** esamina le pratiche di gestione e amministrazione necessarie per implementare efficacemente i progetti e le misure previste, garantendo trasparenza, partecipazione e sostenibilità nella governance locale;
- **business plan:** fornisce orientamenti e strumenti per la pianificazione economica e finanziaria dei progetti, aiutando le amministrazioni locali e le imprese a elaborare piani d'azione sostenibili e ben strutturati;
- **finanziamenti:** dettaglia le opportunità di finanziamento disponibili, comprese le fonti di finanziamento pubblico e privato, e fornisce indicazioni su come accedere ai fondi e gestirli in modo efficiente.

Ogni sezione dell'Atlante è arricchita con schede informative dettagliate che esplorano in maniera esaustiva le possibilità e le soluzioni pratiche disponibili. Questo approccio consente agli utenti dell'Atlante di ottenere una panoramica completa delle opzioni, facilitando la pianificazione e l'implementazione di interventi mirati e sostenibili.

Le informazioni fornite sono progettate per rispondere alle specifiche esigenze dei territori delle Madonie, garantendo che le soluzioni proposte siano non solo teoricamente valide, ma anche realizzabili e adattate alle condizioni locali. In questo modo, l'Atlante si propone come uno strumento fondamentale per orientare e supportare gli interventi di riqualificazione e sviluppo sostenibile nelle comunità locali.

EFFICIENTAMENTO ENERGETICO

VULNERABILITÀ SISMICA

RECUPERO IDRICO

ACCESSIBILITÀ

COMUNITÀ ENERGETICHE

DECORO URBANO

ADEGUAMENTO ACUSTICO

DIGITALIZZAZIONE

COOPERATIVE DI COMUNITÀ

GOVERNANCE

BUSINESS PLAN

FINANZIAMENTI

Petralia Soprana; ©Luisa Lombardo, 2023

VALUTAZIONE DELL'EFFICIENZA ENERGETICA PER IL PATRIMONIO COSTRUITO E PROPOSTE DI INTERVENTO

Geraci Siculo; ©Quelli del Parco delle Madonie, 2023

7.1 - LA DIAGNOSI ENERGETICA DEGLI EDIFICI STORICI

La diagnosi energetica rappresenta uno dei processi fondamentali nella riqualificazione energetica degli edifici. È cruciale definire con chiarezza e precisione sia lo scopo che le modalità di esecuzione di tale procedura.

In tale contesto, il CEN ha recentemente pubblicato la norma UNI CEI EN 16247-1, la quale, come prima di una serie dedicata, definisce la diagnosi energetica come una "verifica sistematica e analisi degli usi e dei consumi di energia di un sito, edificio, sistema o organizzazione, con l'obiettivo di identificare e documentare i flussi di energia e il potenziale per miglioramenti di efficienza energetica".

Specificamente per gli edifici, la diagnosi energetica è una procedura sistematica che si propone di:

- definire il bilancio energetico del sistema edificio-impianto e individuare i potenziali recuperi delle energie disperse;
- valutare le condizioni di benessere termoigrometrico e di sicurezza necessarie e identificare soluzioni appropriate per il risparmio energetico;
- valutare le opportunità di risparmio energetico dal punto di vista tecnico-economico e ottimizzare le modalità di gestione del sistema edificio-impianto, inclusi i contratti di fornitura di energia e le modalità di conduzione del sistema, al fine di ridurre i costi di gestione.

Per gli edifici storici, il miglioramento della prestazione energetica può richiedere modifiche all'organismo architettonico che, se non progettate accuratamente basandosi su una corretta diagnosi energetica, possono comportare problemi significativi, quali il compromesso del valore monumentale e/o documentale del manufatto o la messa in discussione della sicurezza statica dell'edificio.

Pertanto, il progettista termotecnico che interviene su un edificio storico, in particolare se vincolato ai sensi del DLgs 42/2004, deve acquisire una documentazione esaustiva riguardante non solo gli aspetti tecnici, ma anche il ruolo storico e il contesto urbano e paesaggistico dell'edificio.

Di seguito sono riportati i principi teorici della diagnosi energetica; per un'analisi più approfondita, si rinvia alla documentazione AiCARR sull'argomento. Lo scopo principale della diagnosi energetica è la valutazione dei consumi energetici dell'edificio al fine di ridurli, mantenendo le condizioni di qualità dell'ambiente interno precedentemente descritte.

Per conseguire questo obiettivo, è necessario identificare innanzitutto le funzioni che i sistemi architettonici e tecnologici devono soddisfare, che possono variare dalla semplice climatizzazione in edifici residenziali o terziari, al controllo del microclima per edifici che ospitano collezioni, fino al controllo dell'umidità da risalita in presenza di falde acquifere o acque disperse nel sottosuolo.

Successivamente, è necessario identificare i vettori energetici utilizzati da ciascun servizio e i flussi di energia associati a ciascun vettore.

Questa analisi consente di valutare l'efficienza energetica di ogni servizio e di identificare le opportunità di risparmio energetico ed economico applicabili all'edificio in esame.

Esistono tre tipologie principali, o livelli, di diagnosi energetica, ordinati in base alla loro complessità:

Diagnosi per ispezione visiva o diagnosi leggera: Consiste essenzialmente nell'ispezionare visivamente ciascuno dei sistemi e/o sottosistemi presenti nell'edificio che scambiano energia. Generalmente include anche una valutazione dei dati di consumo energetico per analizzare le quantità e i profili di utilizzo dell'energia e fornire un confronto con valori medi di riferimento. Questa diagnosi, la meno costosa, può identificare opportunità di risparmio a basso costo tramite miglioramenti nelle procedure di gestione e manutenzione e fornire una stima preliminare del potenziale di risparmio. È utile anche come screening per determinare se è necessario passare ai livelli successivi, più accurati e costosi.

Diagnosi standard: Prevede la quantificazione degli usi e delle perdite di energia, revisionando e analizzando gli apparati e i sistemi e le loro caratteristiche operative, e l'analisi economica delle misure di risparmio energetico raccomandate. Questa diagnosi può includere misure sul posto e verifiche prestazionali per quantificare l'impiego di energia e l'efficienza energetica dei vari sistemi, utilizzando strumenti di calcolo standard come le procedure riportate nelle UNI TS 11300.

Diagnosi dettagliata: Consiste in un'analisi approfondita degli usi e degli impieghi di energia, specializzata per funzione e/o destinazione d'uso, e in una valutazione dei profili di utilizzo dell'energia attraverso l'utilizzo di programmi di calcolo per la simulazione dinamica del sistema energetico considerato. Questo è il livello più costoso sia in termini temporali che economici, giustificato da un'elevata complessità dell'edificio o del sistema in esame, che

non può essere trattata adeguatamente con i livelli precedenti.

Nella Tabella 1 è riportato un confronto tra i tre livelli di diagnosi. Una volta stabilito il tipo di diagnosi da eseguire, è necessario raccogliere informazioni sui componenti strutturali e meccanici che influenzano l'impiego di energia nell'edificio e sulle modalità di funzionamento e gestione del sistema edificio-impianto.

Molte di queste informazioni possono e dovrebbero essere raccolte prima della visita all'edificio: una valutazione approfondita degli impieghi energetici e dei sistemi utilizzatori pre-ispezione aiuta a identificare le aree di potenziale risparmio energetico, ottimizzando il sopralluogo.

Dopo aver stabilito il livello di diagnosi da eseguire, si procede alla fase operativa, che include una serie di attività comuni a tutti i livelli, anche se con gradi di approfondimento variabili. Queste attività possono essere sintetizzate come segue:

Attività di pre-ispezione:
- raccolta e analisi delle informazioni sui consumi pregressi;
- raccolta dei disegni e delle specifiche tecniche relative al progetto esecutivo e a quello "as built" dell'architettura, degli impianti meccanici e degli impianti elettrici;
- individuazione e posizionamento sui disegni dell'edificio delle apparecchiature, dei sistemi e degli impianti interessati ai consumi energetici;
- descrizione delle apparecchiature, dei sistemi e degli impianti interessati ai consumi energetici;
- calcolo degli indicatori energetici da confrontare con quelli di edifici simili;
- elaborazione di una lista di opportunità di risparmio energetico e di procedure di manutenzione e gestione da adottare.

Attività di ispezione:
- verifica puntuale di quanto individuato o ipotizzato nella pre-ispezione e raccolta di tutti i dati non disponibili in precedenza, con particolare attenzione alle opportunità di risparmio energetico e alle procedure di manutenzione e gestione.

Attività di post-ispezione:
- definizione delle opportunità di risparmio energetico e delle procedure di manutenzione e gestione.

Come accennato nell'introduzione, la diagnosi energetica di un edificio storico presenta sfide particolari. Il principale ostacolo è la mancanza di piante e sezioni adeguate, e la limitata conoscenza dei materiali e delle stratigrafie delle pareti interne ed esterne. Tali problematiche sono comuni a molti edifici esistenti e possono complicare l'individuazione delle caratteristiche termofisiche delle strutture murarie.

Nel caso degli edifici storici, la difficoltà aumenta, poiché, a meno di ricerche d'archivio, è difficile risalire alla fabbrica originale e alle modifiche subite nel corso degli anni o dei secoli.

Talvolta è possibile risalire alla stratigrafia delle pareti in modo non distruttivo o intrusivo, ad esempio attraverso tecniche endoscopiche applicate a passaggi o interstizi esistenti nelle murature.

Tuttavia, tali tecniche possono risultare costose e non sempre sono in grado di rivelare modifiche nascoste sotto intonaci di valore variabile, difficili da individuare anche con la termografia all'infrarosso.

Castellana Sicula; ©Luisa Lombardo, 2023

TIPOLOGIA	CARATTERISTICHE	RISULTATI	TEMPI
I Livello: Leggera	Visita all'edificio oggetto di diagnosi allo scopo di ispezionare visivamente ciascuno dei sistemi e/o dei sottosistemi energetici.	Stima del potenziale di risparmio energetico sulla base dell'indicazione delle ORE a basso costo di investimento. Lista qualitativa degli scenari di intervento. Indicazioni per una successiva analisi di II o III Livello.	Pochi giorni
II Livello: Standard	Analisi energetica dei sistemi impiantistici con modelli di calcolo in regime stazionario. Piccole misurazioni.	Indicazione delle ORE e degli scenari di intervento da applicare all'edificio tramite analisi energetica, economica e multicriterio.	Poche settimane
III Livello: Dettagliata	Analisi energetica di sistemi impiantistici con modelli di calcolo in regime dinamico. Misurazioni dettagliate sui coponenti.	Valutazione del consumo di energia primaria suddiviso per funzione d'uso, vettore energetico e profili d'uso. Indicazione accurata delle ORE e degli scenari di intervento da applicare all'edificio tramite analisi energetica, economica e multicriterio. Definizione delle interazioni tra i diversi scenari.	Settimane o mesi

Tab. 1 - I tre livelli di diagnosi energetica, ©Luisa Lombardo, 2023

7.2 - PROCEDURE PER MIGLIORARE L'EFFICIENZA ENERGETICA DEGLI EDIFICI

Per miglioramento energetico si intende l'esecuzione di uno o più interventi aventi lo scopo di ridurre l'indice di prestazione energetica senza modificare lo stato strutturale e architettonico del manufatto e cercando di migliorare le condizioni di qualità ambientale.

In Fig. 1 è riportato lo schema di flusso della proposta che AiCARR ha formulato per la procedura di miglioramento dell'efficienza energetica (LL.GG. AiCARR sull'Efficienza Energetica negli Edifici Storici, 2014). La procedura prevede alcune azioni preliminari, mirate a una corretta diagnosi energetica, a valle della quale deve essere calcolato l'indice di prestazione energetica Ep allo stato di fatto.

La diagnosi deve essere anche utilizzata per valutare le possibili azioni di miglioramento, sulla base delle quali va calcolato l'indice di prestazione energetica Ep' post operam. Evidentemente, se il miglioramento ha portato a risultati concreti si può procedere, altrimenti il processo va ripetuto approfondendo i livelli di diagnosi. Questa valutazione di confronto valutazione può essere effettuata utilizzando le schede tecniche per il calcolo dell'energia primaria risparmiata secondo l'Autorità dell'Energia Elettrica, del Gas e del Sistema Idrico (AEEGSI).

Indice di prestazione [kWh/(m^3 • anno)]	Ante-operam	Post-operam	Riduzione percentuale [%]
EPci			
EPacs			
EPce			
EPill			
EPgl (complessivo)			

Fig. 2 – Schema per la valutazione degli effetti degli interventi di riqualificazione energetica, ©Luisa Lombardo, 2022

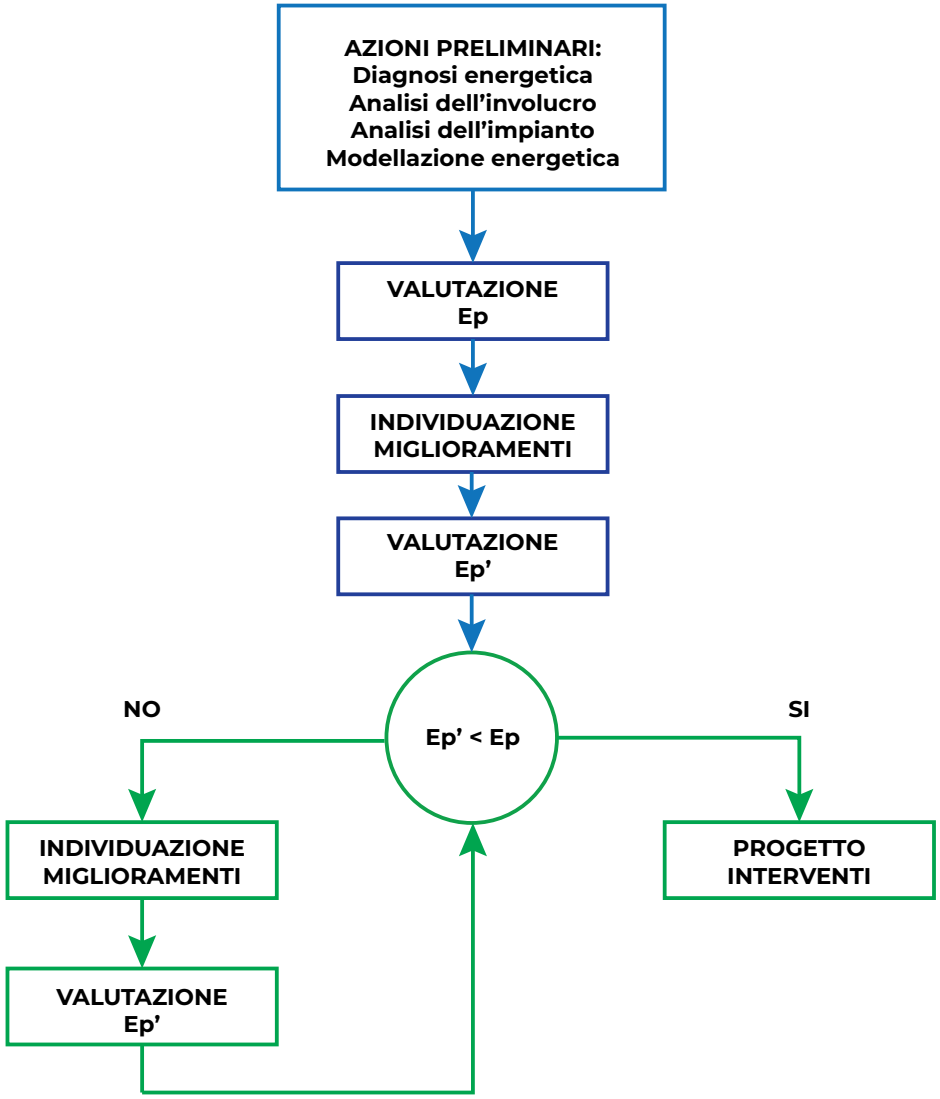


Fig. 1 | Schema di flusso della procedura per il miglioramento dell'efficienza energetica, ©Luisa Lombardo, 2022

La prestazione energetica di un edificio rappresenta la quantità annua di energia effettivamente consumata o prevista come necessaria per soddisfare i vari bisogni connessi a un uso standard dell'edificio.

Tra questi bisogni rientrano la climatizzazione invernale ed estiva, la produzione di acqua calda per usi igienici e sanitari, la ventilazione e l'illuminazione.

La valutazione della prestazione energetica deve considerare una serie di parametri, tra cui:

- gli aspetti climatici della località;
- il livello di isolamento termico dell'involucro;
- l'esistenza di sistemi di generazione propria di energia;
- le caratteristiche tecniche e di installazione dell'impianto;
- il microclima degli ambienti interni.

La prestazione energetica complessiva dell'edificio è espressa tramite l'indice di prestazione energetica globale (EPgl), che rappresenta il consumo di energia primaria riferito all'unità di superficie utile o al volume lordo per il riscaldamento, il raffrescamento, la produzione di acqua calda per usi igienico-sanitari, l'illuminazione e l'eventuale ventilazione. L'indice EPgl si calcola come:

EPgl = EPci + EPacs + EPce + EPill

dove:

- **EPci** = indice di prestazione energetica per la climatizzazione invernale;
- **EPacs** = indice di prestazione energetica per la produzione di acqua calda sanitaria;
- **EPce** = indice di prestazione energetica per la climatizzazione estiva;
- **EPill** = indice di prestazione energetica per l'illuminazione artificiale.

Gli indici di prestazione sono espressi in kWh/m^2anno o kWh/m^3anno, secondo le indicazioni previste dalle norme europee e nazionali vigenti.

Il valore ottenuto dal calcolo è un indicatore prestazionale che può essere confrontato con i valori derivanti dai calcoli effettuati su altri edifici, a condizione che le ipotesi adottate siano congruenti.

A tale riguardo, è opportuno precisare che la valutazione del fabbisogno energetico di un edificio, essendo effettuata mediante un metodo di calcolo, può risentire delle diverse ipotesi che il progettista ritiene utili o necessarie adottare.

Il valore ottenuto può essere modificato grazie all'adozione di soluzioni diverse, quali le migliorie nel sistema di produzione energetica o nelle prestazioni degli elementi dell'involucro, che consentono di valutare la praticabilità energetica di una determinata operazione.

Come già detto, leggi e norme impongono di considerare il sistema edificio-impianto come un unico blocco. È tuttavia opportuno, nella fase di valutazione delle prestazioni energetiche, distinguere i contributi energetici richiesti per il fabbisogno energetico dovuto al raffrescamento da quelli dovuti al riscaldamento, l'energia richiesta dal sistema impianto e l'energia primaria richiesta dall'intero sistema edificio-impianto. Tale determinazione consente di effettuare la diagnosi energetica in modo più comprensibile.

Per il calcolo degli indici di prestazione energetica dell'edificio, si fa riferimento ai metodi riportati nelle Specifiche Tecniche UNI della serie 11300, tutte espressamente richiamate dalla legislazione italiana e quindi vincolanti.

Sulla base di quanto detto, la valutazione della prestazione energetica di un edificio storico va effettuata almeno due volte: la prima per definire lo stato di fatto dell'edificio, la seconda per valutare i risultati ottenuti a valle dei miglioramenti.

Questa valutazione può risultare affetta da imprecisioni e/o errori legati alle difficoltà di reperimento dei dati relativi alle caratteristiche termofisiche del sistema edificio-impianto.

Si deve provvedere alla valutazione della prestazione energetica ante e post-operam. I risultati ottenuti vanno sintetizzati nello schema della tabella precedente. La matrice, compilata a cura del progettista dell'intervento sulla base della documentazione prodotta, viene valutata dalla Soprintendenza.

Il miglioramento della prestazione energetica di un edificio prevede interventi caratterizzati da un significativo risparmio percentuale di energia primaria complessiva, da valutare caso per caso.

INDICE DELLE SOLUZIONI TECNOLOGICHE INDIVIDUATE

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In. 02 - Isolamento all'estradosso della copertura ventilata
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In. 04 - Isolamento esterno
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In. 06 - Isolamento interno
In. 07 - Isolamento all'estradosso del solaio in corrispondenza di locali non riscaldati
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LEGENDA ICONE

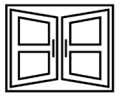
Efficientamento energetico edificio

Intervento in copertura

Intervento nelle partizioni verticali

Intervento nel solaio controterra

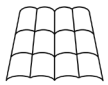
Intervento nel sottotetto



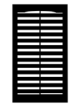
Intervento negli infissi interni

Intervento nelle schermature mobili

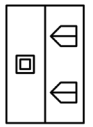
Installazione di sistemi di accumulo



Modifica del manto di copertura



Intervento nelle schermature fisse



Intervento passivo in copertura

Alcune schede tecniche sono corredate di un alert, che segnala la compatibilità dell'intervento con il contesto:
Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.
Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

In. 01 ISOLAMENTO ALL'ESTRADOSSO DELLA COPERTURA NON VENTILATA

PRINCIPIO DI FUNZIONAMENTO

L'isolamento all'estradosso della copertura non ventilato consente di migliorare la coibentazione dell'involucro e di ridurre i ponti termici di forma e di struttura. L'intervento prevede la rimozione e sostituzione del manto di copertura attraverso l'applicazione di uno strato continuo di pannelli isolanti protetti all'esterno da uno strato di finitura, che può essere composto dalle tegole nel caso di tetti spioventi, o da ghiaia o pavimento nel caso di tetti piani. Per garantire la reversibilità del sistema, è buona norma utilizzare giunti a secco per pannelli isolanti; inoltre, è necessario verificare che la struttura portante sia compatibile con il sovraccarico derivante dalla posa dei pannelli. A seconda delle caratteristiche specifiche della copertura, è possibile optare per la soluzione tecnologica del tetto caldo o del tetto rovescio; l'uso di barriera al vapore può essere evitato utilizzando isolanti impermeabili o integrando l'uso di isolanti igroscopici e traspiranti (come i materiali fibrosi) con una pendenza dell'1,5-2% sotto lo strato isolante per far defluire l'acqua. Nella posa, è necessario verificare la continuità del manto isolante per evitare infiltrazioni; i punti maggiormente critici riguardano i ponti termici per forma, i punti di raccolta delle acque meteoriche e le pendenze.

APPLICABILITÀ

L'isolamento all'estradosso della copertura non ventilato rappresenta un'alterazione dei prospetti dell'edificio; può dunque essere realizzato solo nel caso in cui sia compatibile con i caratteri estetici e tecnologici della copertura. Nela caso di tetti spioventi, qualora le tegole esistenti siano in buone condizioni o abbiano un valore storico ed estetico che ne richiesa la conservazione, esse possono essere ripristinare sulla nuova copertura. Dato che l'isolamento esterno consente l'uso della struttura portante della copertura come massa termica, la soluzione è ottimizzata per ambienti sottotetto utilizzati e con funzionamento continuo dell'impianto di riscaldamento.

VANTAGGI / SVANTAGGI / RISCHI

La svantaggio maggiore dell'isolamento dell'estradosso della copertura non ventilato riguarda la necessità di rifacimento complessivo del tetto, che può modificare i prospetti esterni. Se lo strato isolante è all'estradosso, analogamente all'isolamento a cappotto delle chiusure verticali, esso garantisce l'eliminazione dei ponti termici strutturali, aumentando la temperatura superficiale delle pareti interne e riducendo il rischio di condensa. L'uso di isolante esterno consente di sfruttare l'inerzia termica della struttura portante della copertura per stabilizzare la condizioni di comfort interne e ottimizzare il funzionamento dell'impianto di climatizzazione. In caso di tetti a falda o con struttura a scheletro, il sistema rappresenta una protezione della struttura dagli stock termici, contribuendo ad aumentare la durata.

SINERGIE E INTERAZIONI

L'isolamento esterno della copertura non ventilato è maggiormente efficace nella riduzione dei ponti termici se abbinato all'isolamento esterno delle chiusure verticali corrispondenti e alla sostituzione, integrazione o rinnovo degli infissi; per evitare fenomeni di condensa, è bene garantire un certo grado di ventilazione al sistema.

NORMATIVA DI RIFERIMENTO

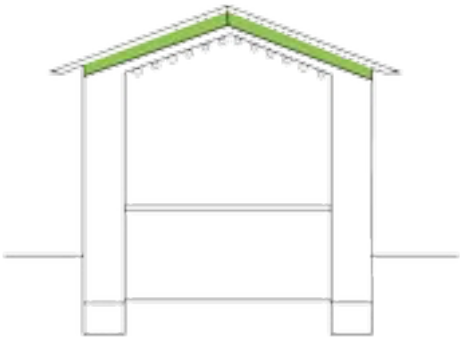
UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

CHIUSURE ORIZZONTALI SUPERIORI OPACHE

integrazione volumetrica

COMPATIBILITÀ : B
REVERSIBILITÀ : B - M
INVASIVITÀ : B - M
AZIONI isola
accumula

SOLUZIONE CONFORME



In. 02 ISOLAMENTO ALL'ESTRADOSSO DELLA COPERTURA VENTILATA

PRINCIPIO DI FUNZIONAMENTO

L'isolamento all'estradosso della copertura ventilato consente di migliorare la coibentazione dell'involucro, di ridurre i ponti termici di forma e di struttura. L'intervento prevede la rimozione e sostituzione del manto di copertura, attraverso l'applicazione di uno strato continuo di pannelli isolanti e la realizzazione di un'intercapedine ventilata a ridosso dell'isolamento; può essere realizzato anche su una copertura piana, ma normalmente viene impiegato nel caso di falde inclinate con struttura in legno. Lo strato di ventilazione evita la formazione di condensa e, durante la stagione estiva, facilita la formazione di moti convettivi che dissipano il calore delle strutture, contribuendo al raffrescamento passivo degli ambienti sottotetto. Per garantire la reversibilità del sistema, è buona norma utilizzare giunti a secco per pannelli isolanti; inoltre, è necessario verificare che la struttura portante sia compatibile con il sovraccarico derivante dalla posa dei pannelli e dal supporto dell'intercapedine. Lo strato ventilato rede normalmente superfluo l'utilizzo di una barriera al vapore; dato che l'intercapedine evita i ristagni d'acqua, è possibile impiegare sia isolanti impermeabili che materiali igroscopici e fibrosi.

APPLICABILITÀ

L'isolamento all'estradosso della copertura ventilato rappresenta un'alterazione dei prospetti dell'edificio; può dunque essere realizzato solo nel caso in cui sia compatibile con i caratteri estetici e tecnologici della copertura. Nel caso di tetti spioventi, qualora le tegole esistenti siano in buone condizioni o abbiano un valore storico ed estetico che ne richiesa la conservazione, esse possono essere ripristinare sulla nuova copertura. Dato che l'isolamento esterno consente l'uso della struttura portante della copertura come massa termica, la soluzione è ottimizzata per ambienti sottotetto utilizzati e con funzionamento continuo dell'impianto di riscaldamento.

VANTAGGI / SVANTAGGI / RISCHI

La svantaggio maggiore dell'isolamento dell'estradosso della copertura non ventilato riguarda la necessità di rifacimento complessivo del tetto e nella modifica dell'altezza della linea di gronda per alloggiare l'intercapedine ventilata. Se lo strato isolante è all'estradosso, analogamente all'isolamento a cappotto delle chiusure verticali, esso garantisce l'eliminazione dei ponti termici strutturali, aumentando la temperatura superficiale delle pareti interne, mentre la presenza dell'intercapedine ventilata riduce il rischio di condensa. L'uso di isolante esterno consente di sfruttare l'inerzia termica della struttura portante della copertura per stabilizzare le condizioni di comfort interne e ottimizzare il funzionamento dell'impianto di climatizzazione. In caso di tetti a falda o con struttura a scheletro, il sistema rappresenta una protezione della struttura dagli stock termici, contribuendo ad aumentare la durata.

SINERGIE E INTERAZIONI

L'isolamento esterno della copertura ventilato è maggiormente efficace nella riduzione dei ponti termici se abbinato all'isolamento a cappotto delle chiusure verticali corrispondenti e alla sostituzione, integrazione o rinnovo degli infissi.

NORMATIVA DI RIFERIMENTO

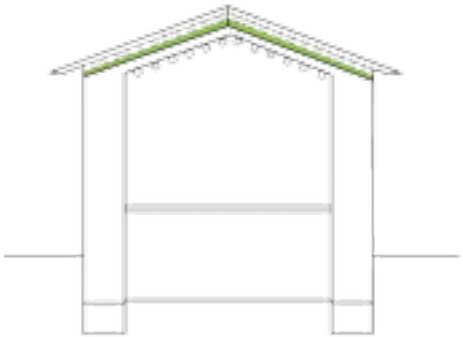
UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

CHIUSURE ORIZZONTALI SUPERIORI OPACHE

integrazione volumetrica

COMPATIBILITÀ : B
REVERSIBILITÀ : B - M
INVASIVITÀ : B - M
AZIONI isola
accumula

SOLUZIONE CONFORME



In. 03 ISOLAMENTO ALL'INTRADOSSO DELLA COPERTURA

PRINCIPIO DI FUNZIONAMENTO

L'isolamento all'intradosso della copertura consente di migliorare la coibentazione dell'involucro quando non è possibile intervenire all'estradosso. Dato che l'intervento riduce il volume utile dei locali, è necessario garantire il rispetto dei vincoli di altezza da normativa; inoltre, è buona norma scegliere materiali isolanti con alte prestazioni anche in presenza di spessori ridotti, come gli isolanti termoriflettenti o sottovuoto. La posa può prevedere l'uso di pannelli autoportanti, fissati all'intradosso del solaio o della struttura portante del tetto spiovente tramite agganci a secco; qualora le volumetrie esistenti lo permettano, è possibile distanziare l'isolamento del solaio, realizzando un'intercapedine ventilata interna che riduce la formazione di condensa, migliora il raffrescamento estico e permette l'alloggiamento degli impianti. Per l'isolamento con lastre inserite direttamente a contatto con il solaio esistente è opportuno scegliere materiali dotati di ridotta conducibilità termica e buona permeabilità alla diffusione al vapore. Nei controsoffitti isolati e ventilati è possibile utilzzare anche materiali igroscopici, in quanto l'intercapedine d'aria evita la formazione di condensa interstiziale e superficiale.

APPLICABILITÀ

L'isolamento all'intradosso della copertura rappresenta un'alterazione dell'aspetto del sottotetto; può essete realizzato solo nel caso in cui sia copatibile con i caratteri estetici e tecnologici degli ambienti al di sotto della copertura, o quanto il sottotetto non debba essere lasciato a vista. A causa della minore efficienza rispetto all'isolamento esterno, l'intervento viene preferito qualora le coperture esterne non possano essere alterate. Dato che l'isolamento esterno esclude l'uso della struttura portante della copertura come massa termica, è preferibile nel caso di ambienti con un uso intermittente dell'impianto di riscaldamento, o di ambienti non abitabili.

VANTAGGI / SVANTAGGI / RISCHI

Rispetto all'isolamento all'estradoso, l'isolamento all'intradosso presenta maggiori discontinuità e limita l'impiego delle strutture portanti della copertura con masse termiche. Non riesce ad eliminare i ponti termici strutturali, con powssibile formazione di condensa interstiziale, macchie di umidità o muffe. Inoltre, esso riduce il colume utile interno, soprattutto nel caso venga realizzata un'intercapedine; tuttavia, tale intervento consente di realizzare un controsoffitto per alloggiare gli impianti, che può esser molto conveniente in concomitanza del loro eventuale complessivo. L'siolamento all'estradosso è di facile e rapida realizzazione e può essere attuato in maniera selettiva e scaglionata, benchè tale modalità aumenti il rischio di condensa in quanto rende fortemente discontinue le proprietà termiche dell'involucro.

SINERGIE E INTERAZIONI

L'isolamento interno presuppone la fodera di tutte le superfici di confine, incluse le chiusure verticali; inoltre, nel caso di complesse morfologie interne, può essere integrato con l'uso di intonaci termoisolanti, con modalità analoghe agli intonaci termoisolanti esterni verticali.

NORMATIVA DI RIFERIMENTO

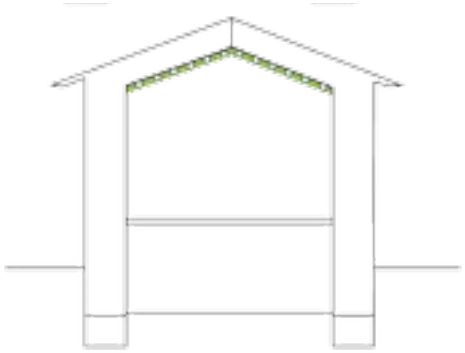
UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

CHIUSURE ORIZZONTALI SUPERIORI OPACHE

integrazione volumetrica

COMPATIBILITÀ : B
REVERSIBILITÀ : B - M
INVASIVITÀ : B - M
AZIONI isola
accumula

SOLUZIONE CONFORME



In. 04 ISOLAMENTO ESTERNO

PRINCIPIO DI FUNZIONAMENTO

L'isolamento esterno dell'edificio, nei casi in cui il manufatto architettonico non sia con pietra a faccia vista, sviluppato uniformente senza interruzioni su tutta la superficie (tipo a cappotto) è in grado di creare una barriera continua al passaggio di calore e di controllare la formazione di umidità all'interno della parete. Esso consiste nell'applicazione, sull'intera superficie esterna dell'edificio, di pannelli isolanti che vengono protetti da uno spessore di finitura protettivo, realizzato con particolari intonaci. Nella riqualificazione di edifici storici, per la reversibilità dell'intervento è buona norma evitare l'incollaggio dei pannelli, prevedendo piuttosto l'uso di tasselli omologati o profili, a seconda della caratteristiche di complanarità del supporto murario. La scelta dell'isolante deve conformarsi alla permeabilità e traspirabilità del sistema murario: in caso di edifici massivi, è indicato l'uso di materiali fibrosi naturali organizi dotati di buone proprietà igroscopiche.

APPLICABILITÀ

L'isolamento esterno rappresenta un'alterazione dei prospetti dell'edificio; può dunque essere realizzato solo nel caso in cui sia compatibile con i caratteri estetici e tecnologici della facciata. Inoltre, l'intervento può essere poco conveniente qualora la morfologia dell'edificio presenti un numero notevole di discontinuità geometriche che non possono essere interrotte, o rivestite dallo strato isolante (ad esempio, se sono presenti balconi o logge). Dato che l'isolamento esterno consente l'uso delle murature come massa termica, la soluzione è ottimizzata per ambienti con funzionamento continuo dell'impianto di riscaldamento.

VANTAGGI / SVANTAGGI / RISCHI

Lo svantaggio maggiore dell'isolamento a cappotto consiste nella modifica dei prospetti esterni; inoltre, esso influisce fortemente sul comportamento igrometrico dell'edificio. I vantaggi principali risiedono nella possibilità di rivestire in maniera uniforme la superficie esterna, garantendo un buon controllo dei ponti termici per edifici privi di elementi volumetrici sporgenti e limitando le dispersioni termiche e il proliferare di condensa superficiale, macchie di umidità o muffe all'interno dei locali. Inoltre, il cappotto aumentando lo spessore del muro verso l'esterno non porta via spazio ai vani interni come invece si verifica con l'isolamento a fodera interna.
L'uso di un isolante esterno, infine, consente di sfruttare l'inerzia termica delle pareti sul lato interno dell'edificio per stabilizzare le condizioni di comfort e aumentare il riscoldamento radiativo, ottimizzando il funzionamento dell'impianto di climatizzazione. La massa termica può poi essere utilizzata, durante l'estate, per assorbire e dissipare il calore in eccesso, migliorando il raffrescamento passivo dell'edificio.

SINERGIE E INTERAZIONI

L'isolamento esterno delle chiusure verticali è maggiormente efficace nella riduzione dei ponti termici se abbinato all'isolamento delle coperture e dell'attacco a terra e alla sostituzione, integrazione o rinnovo degli infissi; per evitare fenomeni di codenza, tuttavia, è bene garantire un certo grado di ventilazione al sistema.

NORMATIVA DI RIFERIMENTO

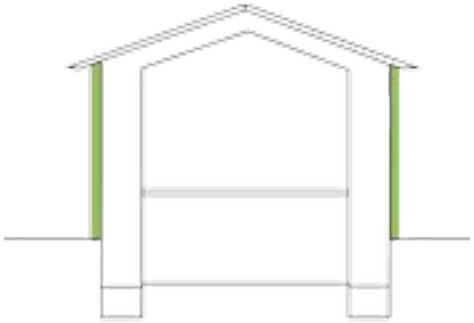
U MASSIMO DI 0,35 W/m²K, UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

PARTIZIONI ESTERNE

integrazione volumetrica

COMPATIBILITÀ : B
REVERSIBILITÀ : B - M
INVASIVITÀ : B - M
AZIONI isola
accumula

SOLUZIONE CONFORME



Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 05 ISOLAMENTO TERMOISOLANTE ESTERNO

PRINCIPIO DI FUNZIONAMENTO

La sostituzione dell'intonaco esterno con un intonaco termoisolante garantisce una buona riduzione dei ponti termici anche in presenza di apparati decorativi o volumetrie sporgenti intonacate. Il materiale è costituito da una malta premiscelata a base di inerti leggeri, leganti idraulici e speciali resine additivanti che migliorano le proprietà termiche dell'intonaco tradizionale. Nella riqualificazione di edifici vincolati, l'uso di calci naturali o l'aggiunta nell'impasto di isolanti espansi o fibrosi garantisce caratteristiche di traspirabilità e permeabilità dell'involucro vicine a quelle della muratura tradizionale, senza alterarne il comportamento igroscopico. Le capacità coibenti dell'intonaco termoisolante sono inferiori a quelle dell'isolamento a cappotto, sia per la maggiore conducibilità termica dei materiali impiegati che per i ridotti spessori; per questa ragione, risulta conveniente, qualora possibile, applicare strati successivi di intonaco fino a raggiungere spessori dai 4 ai 6 centrimenti, che garantiscono una media coibentazione dell'edificio.

APPLICABILITÀ

L'intonaco termoisolante può essere applicato nel caso in cui l'isolamento a cappotto non sia compatibile con i caratteri estetici e tecnologici delle facciate; inoltre, l'intonaco deve ricoprire i prospetti uniformemente Dato che l'intonaco termoisolante esterno consente l'uso delle murature come massa termica, la soluzione è ottimizzata per ambienti con funzionamento continuo dell'impianto di riscaldamento.

VANTAGGI / SVANTAGGI / RISCHI

L'intonaco termoisolante ha un potere coibente inferiore rispetto agli altri sistemi. D'altra parte, esso rappresenta l'ottimizzazione di materiali tradizionali, la cui funziona protettiva li rende deperibili e, in genere, richiede la loro sostituzione periodica: per questa ragione, l'intervento può inserirsi nelle comuni attività di manutenzione delle facciate. Inoltre, la tecniche di paso non richiedono alcuna modifica rispetto ai sistemi correnti, purchè sia garantito uno spessore uniforme e continuo dell'intonaco. Inotlre, l'uso di calci naturali e di isolanti fibrosi inorganici come additivi non altera il comportamento igrometrico delle murature, evitando la formazione di condensa interstiziale, macchie di umidità o muffe. Infine, la facilità di posa riduce il rischio di ponti termici derivanti da cattiva esecuzione dell'intervento di isolamento.

SINERGIE E INTERAZIONI

L'intonaco termoisolante rappresenta un'alternativa rispetto all'isolamento a cappotto. Per una migliore coibentazione dell'edificio, esso andrebbe abbinato alla sostituzione, integrazione o rinnovo degli infissi e all'isolamento delle coperture e dell'attacco a terra, sia con intonaco termoisolante che con sistemi a cappotto, purchè le proprietà coibenti dei materiali utilizzati non siano troppo diversificate, in modo da evitare ponti termici in corrispondenza delle gunzioni.

NORMATIVA DI RIFERIMENTO

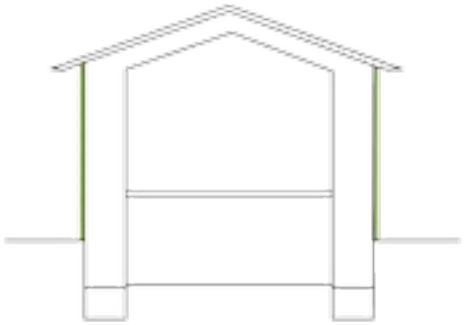
U MASSIMO DI 0,35 W/m²K, UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

PARTIZIONI ESTERNE

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : B - M
INVASIVITÀ : B - M
AZIONI isola
accumula

SOLUZIONE CONFORME



In. 06 ISOLAMENTO INTERNO

PRINCIPIO DI FUNZIONAMENTO

L'isolamento sulle pareti interne dell'edficio consente di migliorare la coibentazione dell'involucro, ma non garantisce l'eliminazione delle discontinuità termihce, con possibile formazione di condensa interstiziale, macchie di umidità o muffe. In particolare, esso permette di eliminare i posti termici relativi agli spigoli verticali e al giunto tra serramento e parete, mentre i ponti termici strutturali tra chiusura verticale e struttura orizzontale richiedono il risvolto dello strato isolante verso l'interno per almeno 100-150 centimetri. Dato che l'intervento determina una diminuzione del volume utile del fabbricato, è buona norma scegliere materiali isolanti con alte prestazioni anche in presena di spessori ridotti, come gli isolanti termoriflettenti o sottovuoto, che non necessitano di barriera al vapore; in ogni caso, in presenza di pareti massive è bene impiegare componenti con proprietà di traspirabilità e permeabilità analoghe a quella della muratura.

APPLICABILITÀ

L'isolamento interno rappresenta un'alterazione delle pareti interne dell'edificio; può dunque essere realizzatio nel caso in cui sia compatibile con i caratteri estetici e tecnologici dei rivestimenti interni. A causa della minore efficienza rispetto all'isolamento esterno, l'intervento viene preferito qualora le facciare esterna non possano essere alterate o non siano intonacate, oppure quando la morfologia dell'edificio presenti un numero notevole di volumi sporgenti come balconi o logge, la cui discontinuità non viene interrotta da un isolamento a cappotto. L'isolamento interno, escludendo l'uso delle murature come massa termica, è preferibile nel caso di ambienti con un uso intermittente dell'impianto di riscaldamento, che entra a regime più rapidamente.

VANTAGGI / SVANTAGGI / RISCHI

Rispetto all'isolamento esterno, l'isolamento interno presenta maggiori discontinuità e, per la riduzione dei ponti termici, necessita di uno sviluppo maggiore delle superfici da rivestire: le facciate verticali, più riscolto su soffitti e pavimenti di ogni ambiente. Ciò riduce anche il volume utile interno e può creare pendenze o dislivelli sulle superfici orizzontali. Inoltre, l'isolamento interno limita l'assorbimento del calore da parte delle masse termiche, aumentano gli sbalzi di temperature e impedendo il raffrescamento passivo radiativo delle pareti. Nondimeno, l'intervento è di facile e rapida realizzazione e può essere attuato in maniera selettiva e scaglionata, benché tale modalità aumenti il rischio di condensa per la forte discontinuità delle proprietà termiche dell'involucro. Dato che l'isolamento interno, se risvoltato sulle superfici orizzontali, può richiedere notevoli opere di adeguamento (rifacimento o integrazione dei pavimenti, spostamento degli impianti), l'intervento è maggiormente conveniente quanto abbinato alla manutenzione generale degli interni.

SINERGIE E INTERAZIONI

L'isolamento interno presuppone la fodera di tutte le superfici di confine, incluse le chiusure orizzontali; inoltre, nel caso di complesse morfologie interne, può essere integrato con l'uso di intonaci termoisolanti, con modalità analoghe agli intonaci termoisolanti esterni.

NORMATIVA DI RIFERIMENTO

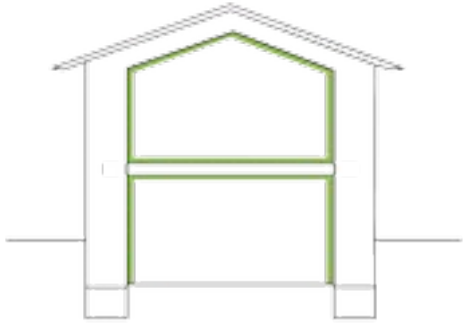
U MASSIMO DI 0,35 W/m²K, UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

PARTIZIONI ESTERNE

integrazione volumetrica

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B - M
AZIONI isola

SOLUZIONE CONFORME



Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

In. 07 ISOLAMENTO ALL'ESTRADOSSO DEL SOLAIO IN CORRISPONDENZA DEI LOCALI NON RISCALDATI

PRINCIPIO DI FUNZIONAMENTO

La presenza di un locale non riscaldato interrato (cantina, garage, locali tecnici) al di sotto del solaio inferiore dell'edificio, consente di applicare lo strato di isolamento in maniera continua sulla superficie di estradosso, migliorando la coibenza termica dell'involucro e riducendo i ponti termici. Il volume d'aria interrato, inoltr, soprattutto se dotato di aperture verso l'esterno, può essere considerato un'intercapedine ventilata che evita la formazione di condensa e, durante la stagione estiva, facilita la formazione di moti convettivi che dissipano il calore delle strutture, contribuendo al raffrescamento passivo degli ambienti. Per garantire la reversibilità del sistema, è buona norma utilizzare giunti a secco per i pannelli isolanti.
Lo strato ventilato rende nromalmenre superfluo l'utilizzo di una barriera al vapore; dato che l'intercapedine evita i ristagni d'acqua, è possibile impiegare sia isolanti impermeabili che materiali igroscopici e fibrosi. Qualora non sia possibile prevedere un isolamento con apnnelli isolanti, è possibile ottenere medi risultati di coibentazione anche applicando sulla superficie di estradosso un intonaco termoisolante, con modalità in tutto simili all'intonaco termoisolante su chiusure verticali.

APPLICABILITÀ

L'isolamento all'estradosso del solaio inferiore può essere realizzato solo nel caso esistano locali interrati non riscaldati. L'intervento non altera le caratteristiche estetiche dell'edificio; nondimeno, deve essere verificata la sua compatibilità con il sistema tecnologico di fondazione e con gli eventuali impianti. Dato che l'isolamento esterno consente l'uso della struttura portante del solaio come massa termica, la soluzione è ottimizzata per ambienti sottotetto utilizzati e con funzionamento continuo dell'impianto di riscaldamento.

VANTAGGI / SVANTAGGI / RISCHI

Se lo strato isolante è all'estradosso, analogamente all'isolamento a cappotto delle chiusure verticali, esso garantisce la riduzione dei ponti termici strutturali, aumentando la temperatura superficiale del solaio; la presenza di locali non riscaldati eventualmente ventilati, inoltra riduce il rischio di condensa. L'uso di isolante esterno consente di sfruttare l'inerzio termica della struttura portante dell'attacco a terra per stabilizzare le condizioni di confort interne e ottimizzare il funzionamento dell'impianto di climatizzazione.

SINERGIE E INTERAZIONI

L'isolamento all'estradosso del solaio di inferiore è maggiormente efficace nella riduzione dei ponti termici se abbinato all'isolamento a cappotto delle chiusure verticali e alla sostituzione, integrazione o rinnovo degli infissi.

NORMATIVA DI RIFERIMENTO

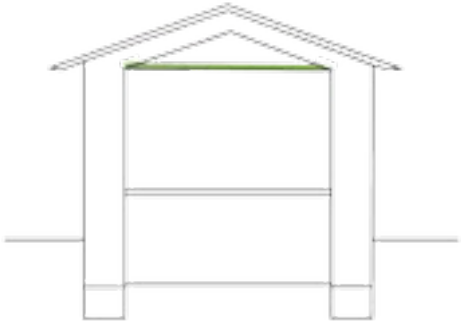
UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

CHIUSURE ORIZZONTALI

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola
accumula

SOLUZIONE CONFORME



In. 08 ISOLAMENTO ALL'INTRADOSSO DEL SOLAIO SU TERRENO

PRINCIPIO DI FUNZIONAMENTO

Nel caso di un solaio posto a diretto contatto con il terreno, l'isolamento può essere realizzato nella superficie interna del solaio, con modalità in tutto simili all'isolamento interno delle chiusure verticali. Tale intervento permette di ridurre lo scambio termico con il terreno, senza eliminare i ponti termici. Per evitare la risalita capillare di umidità, è buona norma prevedere un'impermeabilizzazione sotto l'isolante ed eventualmente, qualora sia compatibile con il comportamento igrometrico dell'involucro, una barriera al vapore verso l'interno del locale per evitare la condensa superficiale. I pannelli di isolamento vengono aggrappari a secco direttamente sul solaio. Nel caso l'ambiente a contatto con il terreno sia abitato, il materiale isolante deve essere calpestabile e dotato di una buona resistenza meccanica; inoltre, è necessario prevedere una finitura superficiale o una pavimentazione su uno strato di massetto di allettamento. Dato che l'intarvento determina una diminuzione del volume utile del fabbricato, è buona norma scegliere materiali isolanti con alte prestazioni anche in presenza di spessori ridotti.

APPLICABILITÀ

L'isolamento all'intradosso del solaio rappresenta un'alterazione delle pavimentazioni; può dunque essere realizzato nel caso in cui sia compatibile con i caratteri estetici e tecnologici dei rivestimenti interni. Benchè sia meno efficiente rispetto all'isolamento esterno, l'intervento risulta inevitabile qualora l'involucro dell'edificio sia a diretto contatto con il terreno o con un vespaio, in assenza di locali interrati non riscaldati. Dato che l'isolamento interno esclude l'uso delle murature come massa termica, è preferibile nel caso di ambienti con un uso intermittente dell'impianto di riscaldamento, che entra a regime più rapidamente.

VANTAGGI / SVANTAGGI / RISCHI

Rispetto all'isolamento esterno, l'isolamento interno presenta maggiori discontinuità e, per la riduzione dei ponti termici, necessita uno sviluppo maggiore delle superfici da rivestire: il pavimento, più il risvolto dulle facciare verticali di ogni ambiente. Ciò porta ad una diminuzione del colume utile interno e delle altezza, da verificare rispetto ai vincoli di normativa. Inoltre, l'isolamento interno limita l'assorbimento del calore da parte delle masse termiche del solaio di fondazione, aumentando gli sbalzi di temperatura e impedendo il raffrescamento passivo radiativo delle pareti. Nondimeno, l'intervento è di facile e rapida realizzazione e può essere attuato in maniera selettiva e scaglionata, benchè tale modalità aumenti il rischio di condensa in quanto rende fortemente discontinue le proprietà termiche dell'involucro.

SINERGIE E INTERAZIONI

L'isolamento all'intradosso del solaio sul terreno è maggiormente efficace nella riduzione dei ponti termici se abbinato all'isolamento interno delle chiusure verticali e alla sostituzione, integrazione o rinnovo degli infissi.

NORMATIVA DI RIFERIMENTO

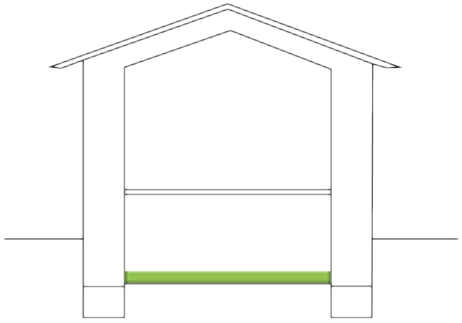
UNI EN ISO 13788:2003, UNI EN ISO 10211:2008, D.M. 26.01.2010

CHIUSURE ORIZZONTALI

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola
accumula

SOLUZIONE CONFORME



Come discusso in precedenza nelle schede, l'installazione dell'isolante può avvenire sia sulla facciata esterna che su quella interna delle pareti dell'edificio, oppure si può considerare l'uso di intonaco termico come alternativa.

Nel caso in cui l'isolante sia applicato sulla facciata esterna, il sistema contribuisce a mantenere le pareti più fresche durante l'estate e più calde durante l'inverno, incrementando così il livello di comfort abitativo. Inoltre, un corretto isolamento esterno previene la formazione di condensa all'interno del muro e la comparsa di muffe, migliorando la salubrità dell'ambiente interno.

D'altra parte, se si opta per l'isolamento interno, è importante considerare che durante l'inverno, la differenza di temperatura tra l'interno dell'abitazione e l'esterno più freddo provoca il passaggio dell'umidità attraverso l'isolante. Quando il vapore acqueo raggiunge la parete fredda, si forma condensa. Per mitigare questo problema, è possibile utilizzare una barriera al vapore, ovvero uno strato completamente impermeabile. Tuttavia, questa soluzione può comportare rischi qualora il flusso d'umidità si inverta.

Per gli spazi interni, è preferibile utilizzare isolanti traspiranti come la fibra di legno, il silicato di calcio o il sughero, evitando l'uso di barriere al vapore. È altresì importante non coprire le pareti isolate con mobili o arredi, in modo da permettere al muro di "respirare" e mantenere le sue proprietà isolanti.

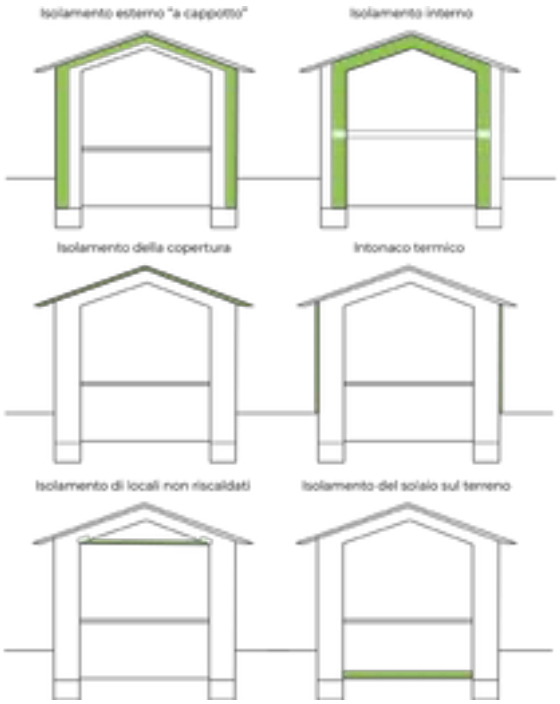
In termini di vantaggi, l'isolamento esterno offre benefici significativi rispetto a quello interno, tra cui:

- maggiore efficienza termica sia in inverno che in estate;
- soluzione più semplice per la correzione dei ponti termici, poiché l'isolamento interno può risultare difficile da applicare negli angoli tra soffitto e parete;
- ridotto rischio di condensa interstiziale;
- maggiore semplicità di installazione.

Nel confronto tra isolamento interno ed esterno, si consiglia di intervenire sulla facciata esterna quando possibile. Per l'isolamento esterno, si raccomanda l'uso di materiali come EPS (polistirene espanso), PIR (poliisocianurato) o pannelli in legno. È importante notare che l'XPS (polistirene estruso) tende a deformarsi nel tempo e non è pertanto consigliato per applicazioni esterne.

Nel caso in cui l'installazione di un cappotto esterno non sia praticabile, come per edifici soggetti a vincoli della Soprintendenza, ad esempio quelli situati nelle Madonie a causa delle loro caratteristiche storiche e di pregio, o per l'isolamento di singoli appartamenti in condomini, l'isolamento interno rappresenta una valida alternativa.

Di seguito sono riportati i sistemi di isolamento proposti nell'Atlante.



MATERIALI ISOLANTI

Dal punto di vista tecnologico, il cappotto rappresenta l'applicazione di un rivestimento isolante sulla superficie esterna o interna delle pareti di un edificio. Come suggerisce il termine, esso funge da vero e proprio "cappotto" per la nostra abitazione.

L'installazione di un cappotto non solo riduce le dispersioni termiche, ma contribuisce anche alla correzione dei ponti termici. I ponti termici sono aree dell'immobile in cui si verifica un cambiamento di materiale o di geometria dell'elemento, costituendo una sorta di via preferenziale per il passaggio del freddo. Esempi comuni di ponti termici includono l'intersezione tra il pavimento e il muro, il collegamento tra il muro e un pilastro, o gli spigoli delle pareti.

È fondamentale prestare particolare attenzione a questi punti critici, poiché la loro corretta gestione è essenziale per garantire l'efficacia dell'isolamento.

Tra i materiali isolanti disponibili sul mercato vi sono il legno, la canapa, il polistirene estruso (XPS), il polistirene espanso (EPS), e la lana di vetro, tra gli altri. Non esiste un materiale isolante universalmente superiore agli altri; piuttosto, per ciascun caso specifico, esiste una scelta più adatta.

Di seguito vengono elencati i materiali isolanti più comunemente utilizzati, accompagnati dalle loro specifiche tecniche.

MATERIALE	APPLICAZIONI
Polistirene espanso sinterizzato (EPS)	Cappotto esterno, tetti in luoghi freddi, strutture contro-terra e vespai
Polistirene espanso estruso (XPS)	Cappotto esterno, tetti (specialmente piani e "rovesci"), strutture contro-terra e vespai
Poliuretano espanso rigido (PIR - PUR)	Cappotto esterno, tetti in luoghi freddi, strutture contro-terra e vespai
Lana di roccia	Cappotto, isolamento interno, coperture, strutture a rischio incendio
Lana di vetro	Cappotto, isolamento interno e coperture.
Calcio-silicato	Isolamento interno
Fibra di legno	Cappotto, isolamento interno, coperture in zone calde
Sughero	Cappotto, isolamento interno, coperture in zone calde
Aerogel	Isolamento interno

Fig. 1 | Materiali e applicazioni nel settore edilizio, ©Luisa Lombardo, 2022

MATERIALE	PREZZO AL MQ		ORIGINE	UTILIZZI
	Da	a		
Polistirene espanso sinterizzato (EPS)	75 €	100 €	Fossile	Esterno
Polistirene espanso estruso (XPS)	85 €	120 €	Fossile	Esterno - Interno
Poliuretano espanso rigido (PIR - PUR)	80 €	130 €	Fossile	Esterno - Interno
Lana di roccia	85 €	120 €	Minerale	Esterno - Intercapedine
Lana di vetro	85 €	120 €	Minerale	Esterno - Intercapedine
Calcio-silicato	110 €	140 €	Minerale	Interno
Fibra di legno	100 €	140 €	Naturale	Esterno - Interno
Sughero	100 €	160 €	Naturale	Esterno - Interno
Aerogel	280 €	500 €	Naturale	Interno

Fig. 2 | Materiali e caratteristiche, ©Luisa Lombardo, 2022

POLISTERENE ESPANSO SINTERIZZATO (EPS)

Polistirene espanso sinterizzato (EPS)	
Prezzo al mq	75 / 100 €
Resistenza al vapore	20 - 100
Performance estiva	NO
Reazione al fuoco	NO
Resistenza a compressione [Kg/cm2]	0,6 - 2
Conduttività (λ) [W/mK]	0,032 - 0,056
Calore specifico (cp) [J/kg k]	1250 - 1500
Densità [Kg/m3]	10 - 50
Utilizzi	isolare i tetti in luoghi dal clima mite
	isolare le pareti verticali dall'esterno o in intercapedine
	isolare pavimenti e strutture interrate

POLISTERENE ESPANSO ESTRUSO (XPS)

Polistirene espanso estruso (XPS)	
Prezzo al mq	85 / 120 €
Resistenza al vapore	70 - 200
Performance estiva	NO
Reazione al fuoco	NO
Resistenza a compressione [Kg/cm2]	1,5- 7
Conduttività (λ) [W/mK]	0,03 - 0,04
Calore specifico (cp) [J/kg k]	1300 - 1700
Densità [Kg/m3]	25 - 65
Utilizzi	isolare coperture a falde e dei tetti piani, particolarmente nel caso di tetto "rovescio"
	isolare pareti verticali in intercapedine e all'esterno (rischio deformazioni se esposto al sole)
	isolare pavimenti e soffitti e murature contro-terra
	correzione dei ponti termici

POLIURETANO ESPANSO RIGIDO (PIR - PUR)

Poliuretano espanso rigido (PIR - PUR)	
Prezzo al mq	80 / 130 €
Resistenza al vapore	30 - 200
Performance estiva	NO
Reazione al fuoco	NO
Resistenza a compressione [Kg/cm2]	1- 5
Conduttività (λ) [W/mK]	0,024 - 0,034
Calore specifico (cp) [J/kg k]	1400 - 1500
Densità [Kg/m3]	25 - 100
Utilizzi	strutture contro-terra e vespai
	coibentazione dei sottotetti di edifici ubicati anch'essi in zone dal clima mite o rigido

LANA DI ROCCIA

Lana di roccia	
Prezzo al mq	85 / 100 €
Resistenza al vapore	1 - 2
Performance estiva	SI
Reazione al fuoco	SI
Resistenza a compressione [Kg/cm2]	0,6- 2
Conduttività (λ) [W/mK]	0,033 - 0,054
Calore specifico (cp) [J/kg k]	800 - 1030
Densità [Kg/m3]	20 - 200

FIBRA DI LEGNO

Fibra di legno	
Prezzo al mq	90 / 140 €
Resistenza al vapore	2 - 10
Performance estiva	SI
Reazione al fuoco	NO
Resistenza a compressione [Kg/cm2]	0,4- 2
Conduttività (λ) [W/mK]	0,038 - 0,08
Calore specifico (cp) [J/kg k]	1.600 - 2.100
Densità [Kg/m3]	30 - 300

FIBRA DI SUGHERO ESPANSO TOSTATO (ICB)

Fibra di Sughero Espanso Tostato (ICB)	
Prezzo al mq	100 / 160 €
Resistenza al vapore	2 - 10
Performance estiva	SI
Reazione al fuoco	NO
Resistenza a compressione [Kg/cm2]	1- 2,5
Conduttività (λ) [W/mK]	0,036 - 0,06
Calore specifico (cp) [J/kg k]	1.600 - 1.800
Densità [Kg/m3]	100 - 220

AEROGEL

Aerogel	
Prezzo al mq	500 €
Resistenza al vapore	5
Performance estiva	MEDIA
Reazione al fuoco	MEDIA
Resistenza a compressione [Kg/cm2]	0,07- 0,7
Conduttività (λ) [W/mK]	0,014 - 0,020
Calore specifico (cp) [J/kg k]	1000
Densità [Kg/m3]	150

In. 09 SERRAMENTI AD ALTA PRESTAZIONE ENERGETICA

PRINCIPIO DI FUNZIONAMENTO

Nel bilancio energetico di un incolucro il serramento rappresenta un punto critico per le sue caratteristiche costruttive e funzionali, in quanto deve bilanciare le esigenze di isolamento termico, controllo solare, contatto visivo, confort microclimatico e acustico e sicurezza degli utenti. La misura prevede la sostituzione delle finestra esistenti con serramenti ad alta prestazione energetica.
Ai fini di un'ottimizzazione energetica, è necessario progettare un sistema di vetrazione che bilanci le prestazioni d'isolamento termico e controllo solare i in seguito scegliere le caratteristiche del telaio in relazione alle esigenze estetiche, al costo, alla prestazione temica, alla tenuta all'aria.

APPLICABILITÀ

La soluzione completa della finestra necessita innanzi tutto di una valutazione del valore intrinseco del serramento esistente. Se il serramento può essere considerato come elemento di pregio che contribuisce al valore dell'edificio, sarà necessario operare scelte meno incisive.

VANTAGGI / SVANTAGGI / RISCHI

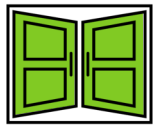
La sostituzione della finestra comporta:
• una riduzione del carico termico legato ai serramento tra il 40% e l'80% a seconda del tipo di vetro che viene sostituito;
• un controllo del guadagno solare legato ai serramenti fino al 70% in caso di uno di vetri basso emissivi o selettivi;
• una riduzione delle infiltrazioni d'aria fino al 94% con un serramento ad alta tenuta.
L'installazione corretta di un nuovo serramento garantisce la tenuta all'aria evitando infiltrazioni indesiderate. Occorre, tuttavia, evitare che l'ermeticità dei nuovi componenti possa pregiudicare la ventilazione dei locali, che deve essere comunque garantita eventualmente attraverso ventilazione meccanica controllata o manuale. La mancanza di ricambi d'aria potrebbe portare alla formazione di condensa superficiale, causa di discomfort termico e di degrado delle pareti.

SINERGIE E INTERAZIONI

La scelta del tipo di serramento da inserire necessita di una valutazione attenta delle prestazioni in essere del serramento esistente, delle variabili climatiche locali, dalla posizione del serramento, dalla funzione dell'edicifio e delle tecniche di posa in opera. È necessario considerare la compatibilità dimensionale e materica della finestra rispetto al vano murario e alla stratigrafia della parete esterna. è opportuno posaere il serramento in continuità dell'isolamento termico e dell'intercapedine della parete, se presente; coibentare il cassonetto e il vano termosifone sotto finestra, se presenti. Sarà inoltre opportuno valutare il funzionamento energetico della muratura esistente, per far si che il comportamento della nuova finestra assecondi e non contrasti quello delle altre pareti dell'edificio. I vantaggi portati dalla sostituzione dell'infisso sono fortemente influenzati dal tipo di telaio (fisso/mobile; taglio termico; tenuta all'aria) e dal tipo di veetro (vetri selettivi, vetri energetici, vetri camera, ecc.)

NORMATIVA DI RIFERIMENTO

D.lgs 311.2006, UNI EN 14351-1:2010, UNI EN ISO 10077



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : B
REVERSIBILITÀ : B - M
INVASIVITÀ : B - M - A
AZIONI isola
capta

MATERIALI COMPATIBILI

LEGNO PVC ALLUMINIO

COLORE TELAI

FINTO LEGNO

TIPOLOGIA DI VETRO

VETROCAMERA – DOPPIO VETRO
DOPPIO VETROCAMERA – TRIPLO VETRO
VETRI BASSO EMISSIVI
VETRO ISOLANTE: INSONORIZZANTI O FONOASSORBENTI
VETRI TERMICI E VETRI A CONTROLLO SOLARE

In. 10 SOSTITUZIONE DEI VETRI CON MODELLI ISOLANTI O CAPTANTI SU TELAIO ESISTENTE

PRINCIPIO DI FUNZIONAMENTO

Il vetro tradizionale non ha buone proprietà di resistenza alla trasmissione del calore. La sua sostituzione con una vetratura dotata di una resistenza termica più elevata migliora la prestazione energetica dell'involucro in quanto riduce le perdite per trasmissione. L'inserimento di una nuova vetrazione comporta anche la riduzione delle infiltrazioni d'aria che si manifestano tra il vetro e il telaio. Per ottimizzare l'intervento è opportuno effettuare una sigillatura dell'involucro. La misura prevede la sostituzione del vetro esistente con vetrazioni ad alta efficienza energetica, conservando il telaio originario. Il vetro deve bilanciare le esigenze di contenimento termico e controllo solare.

APPLICABILITÀ

La sostituzione dei vetri con modelli isolanti o captanti permette di ridurre le dispersioni termiche dell'edificio quando le caratteristiche tecniche o le scelte di carattere estetico-storico non consentono la sostituzione dell'intero serramento. È di fondamentale importanza valutare la resistenza meccanica, lo stato di conservazione e la qualità delle prestazioni termiche del telaio esistente.

VANTAGGI / SVANTAGGI / RISCHI

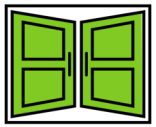
La sostituzione della finestra comporta:
- una riduzione del carico termico legato ai serramenti tra il 50% e l'(5% a seconda del tipo di vetro che viene sostituito;
- un controllo del guadagno solare legato ai serramenti tra il 27% e il 45% in caso di uno dei vetri basso emissivi o selettivi;
- una riduzione delle infoltrazioni d'aria fino all'82% con un serramento ad alta tenuta.

SINERGIE E INTERAZIONI

La sostituzione dei vetri prevede l'impiego di modelli in grado di bilanciare la riduzione delle dispersioni energetiche con il guadagno solare. In base alla valutazione delle necessità energetiche dell'edificio/ambiente, dello stato di conservazione, delle caratteristiche materiche e dimensionali, e della resistenza del telaio, si potrà optare per vetri ad alte prestazioni energetiche del tipo: vetri con rivestimenti selettivi, vetri isolanti, vetri a selettività energetica, vetri comogenici, vetri energetici.
Per ottimizzare l'intervento sarà opportuno sigillare le infiltrazioni d'aria provenienti dalle giunzioni tra il vano murario e il telaio. Il vetro singolo può essere sostituito con una doppia vetrazione in presenza di un telaio in legno massello, lamellare, in alluminio o PVC a taglio termico, caratterizzato da condizioni di buona manutanzione e di tenuta all'aria e all'acqua.

NORMATIVA DI RIFERIMENTO

D.lgs 311.2006, UNI EN 14351-1:2010, UNI EN ISO 10077



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : B
INVASIVITÀ : B - M
AZIONI isola
capta

MATERIALI COMPATIBILI

PVC

COLORE VETRO

INCOLORE

TIPOLOGIA DI VETRO

VETRI TERMICI E VETRI A CONTROLLO SOLARE

In. 11 MESSA IN OPERA SUL LATO INTERNO DI UN SECONDO SERRAMENTO

PRINCIPIO DI FUNZIONAMENTO

Una soluzione per migliorare la qualità termica delle finestre a vetro singolo è mettere in opera una seconda anta vetrata, predisponendo una finestra aggiuntiva con elevata efficienza di vetratura e telaio. L'operazione consiste nell'inserimento di un secondo serramento montato direttamente all'interno della finestra originale storica, che agisce in modo simile ad un doppio vetro. Può essere temporaneo o permanente e deve essere montato a scorrere o aprire verso l'interno in modo da garantire una facile apertura delle finestra originali per scopi di ventilazione, pulizia e fuga di emergenza. Il sistema può essere apribile (a battante o scorrevole) o fisso (rimovibile o leggero).

APPLICABILITÀ

Con questa misura l'aspetto esterno della parete anteriore dell'edificio non verrà modificato, anche se la qualità termica e l'isolamento acustico dell'edificio saranno migliorate notevolmente. È dunque accettabile per la maggior parte degli edifici. Se accuratamente progettato, il sistema può essere relativamente poco invasivo, attraverso telai a scomparsa e una divisione dell'infisso che ricalca quella esteriore. È tuttavia opportuno solo se non influenza il carattere dell'ambiente in cui è installato: ambienti interni di pregio possono essere compromessi dal montaggio di doppi vetri.

VANTAGGI / SVANTAGGI / RISCHI

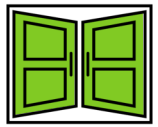
L'inserimento di un secondo serramento comporta: la riduzione delle correnti d'aria e il miglioramento del comfort interno, soprattutto se combinato con una efficientazione delle finestre esistenti; migliori risultati sull'isolamento acustico rispetto ai doppi vetri (per via dell'intercapedine maggiore); costi contenuti rispetto alla sostituzione dei vetri esistenti con doppi o tripli vetri. Il sistema può essere più costoso di semplici interventi di ristrutturazione, e occorrerà fare attenzione durante l'installazione per non danneggiare i serramenti esistenti, o le persiane esistenti. I doppi vetri rimovibili che vengono rimossi in estate richiederanno un'attenta conservazione e sarà fatta attenzione nel selezionare un sistema che consenta l'accesso alle finestra originali per la pulizia e manutenzione. Si raccomanda di migliorare la tenuta all'aria del solo telaio interno e mantenere il battente esterno originale per evitare la formazione di condensa tra le due finestra, potenzialmente dannosa per la conservazione della struttura storica dell'edificio.

SINERGIE E INTERAZIONI

Lo stile e il modo di apertura dell'unità dovrebbe essere visivamente appropriato per la finestra a cui deve essere associato e facile da operare per l'utente finale. La qualità termica di una finestra scatolare può essere migliorata sostituendo la vetrata esistente con una altamente isolante ed efficiente. Tuttavia, non tutte le finestre sono adatte ad accogliere doppi vetri, a causa delle dimensioni o della conformazione irregolare del davanzale interno o per la possibile presenza di persiane interne. Sarà opportuno progettare il serramento aggiuntivo mantenendo un facile accesso alla finestra originale per pulizia o mantenimento.

NORMATIVA DI RIFERIMENTO

D.lgs 311.2006, UNI EN 14351-1:2010, UNI EN ISO 10077



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : B - M
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B - M
AZIONI isola
capta

MATERIALI COMPATIBILI

LEGNO

PVC

ALLUMINIO

COLORE TELAI

FINTO LEGNO

TIPOLOGIA DI VETRO

VETROCAMERA – DOPPIO VETRO
DOPPIO VETROCAMERA – TRIPLO VETRO
VETRI BASSO EMISSIVI
VETRO ISOLANTE: INSONORIZZANTI O FONOASSORBENTI
VETRI TERMICI E VETRI A CONTROLLO SOLARE

In. 12 INSERIMENTO SUL LATO INTERNO DI UNA SECONDA LASTRA DI VETRO (CONTROVENTO)

PRINCIPIO DI FUNZIONAMENTO

La misura prevede la messa in opera di un controvento fisso o apribile nel veno murario esistente sul lato interno dell'anta mobile con opportuni profili fermavetro, per migliorare le prestazioni d'isolamento termico e di riduzione delle infiltrazioni d'aria del serramento. Il controvento, che può essere removibile stagionalmente, consiste in un sistema smontabile e apribile, inquadrato in un profilo metallico di alluminio o acciaio inox, che crea un'intercapedine d'aria per l'aumento dell'inerzia termica. Può essere inserito all'interno o all'esterno: il posizionamento esterno è il più diffuso per ragioni di costi e facilitàù realizzativa, tuttavia l'installazione interna è più efficiente poiché limita le dispersioni, aumenta la tenuta all'aria ed evita la formazione di condensa.

APPLICABILITÀ

L'inserimento di un controvento o di una doppia finestra permette di ridurre le dispersioni termiche dell'edificio quando le caratteristiche tecniche o le scelte di carattere estetico-storico non consentono la sostituzione del vetro o dell'intero serramento. È in ogni modo un intervento che altera l'aspetto originario, anche se in misura contenuta.

VANTAGGI / SVANTAGGI / RISCHI

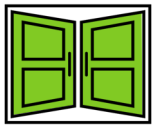
La sostituzione della finestra comporta: una parziale riduzione dei carico termico legato ai serramenti e al tipo di vetro che viene sostituito; una buona riduzione delle infiltrazioni d'aria con un serramento ad alta tenuta. Il beneficio energetico è inferiore rispetto la sostituzione del vetro o dell'intero serramento, ma implica minori problemi di compatibilità e costi d'istallazione. Può ridurre la quantità di luce in entrata e il benessere visivo dell'utente: sarà necessario scegliere vetri con indice di trasmissione luminosa superiore a 0,80. Sarà necessario valutare opportunamente la resistenza meccanica del serramento e del vano murario esistente per sopportare il peso del nuovo vetro. Il controvento apribile è leggero e maneggevole: questo implica deformabilità, delicatezza e ridotta durabilità, problemi di apertura e maneggiabilità. La presenza di un controvento fisso può incidere sulla ventilazione naturale di un locale.

SINERGIE E INTERAZIONI

L'inserimento è conveniente in presenza di finestre con vetri singoli o doppi privi di controllo termico, di telai in buono stato di conservazione e di elevate infiltrazioni d'aria. Sono previste operazioni di verifica della capacità del serramento di sopportare il penso della nuova struttura senza danni; è inoltre importante che lo spessore della nuova struttura non impedisca la rotazione del battente. Per migliorare il contenimento energetico è opportuno utilizzare una doppia vetratura con intercapedine riempita d'aria o gas nobile. Il controvento esterno può essere realizzato con vetro bassoemissivo o selettivo. È importante garantire la compatibilità dimensionale e materica rispetto al vano murario, al rivestimento della faccaita e alla presenza di sistemi di schermatura solare. Occorre verificare la perfetta adesione del controvento sul telaio della finestra: il perimetro deve essere chiuso ermeticamente; è possibile inserire anche della guarnizioni.

NORMATIVA DI RIFERIMENTO

D.lgs 311.2006, UNI EN 14351-1:2010, UNI EN ISO 10077



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : B - M
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B
AZIONI isola
capta

MATERIALI COMPATIBILI

LEGNO

PVC

ALLUMINIO

TIPOLOGIA DI VETRO

VETROCAMERA – DOPPIO VETRO
DOPPIO VETROCAMERA – TRIPLO VETRO
VETRI BASSO EMISSIVI
VETRO ISOLANTE: INSONORIZZANTI O FONOASSORBENTI
VETRI TERMICI E VETRI A CONTROLLO SOLARE

ESEMPI DI FINESTRE NEL TERRITORIO MADONITA

Alimena

Blufi

Bompietro

Caccamo

Caltavuturo

Castelbuono

Castellana Sicula

Collesano

Gangi

ESEMPI DI FINESTRE E PORTEFINESTRE NEL TERRITORIO MADONITA

Geraci Siculo

Gratteri

Isnello

Montemaggiore Belsito

Petralia Soprana

Petralia Sottana

Polizzi Generosa

San Mauro Castelverde

Gangi

In. 13 ISOLAMENTO E TENUTA ALL'ARIA DEL TELAIO

PRINCIPIO DI FUNZIONAMENTO

La misura prevede la sigillatura della giunzione tra il vano finestra e il telaio e l'inserimento di guarnizioni a tenuta all'aria per ridurre le dispersioni d'arial dell'edificio. Le perdite si verificano principalmente nella zone di chiusura del telaio mobile. Per ottimizzare la prestazione l'infisso deve opporre resistenza alle raffiche di vento, e contemporaneamente essere permeabile all'aria, lasciandola filtrare quando è sottoposto alla pressione atmosferica o quando si crea un differenziale termico tra interno ed esterno della facciata. I sigillanti sono elementi tecnici che aumentano le prestazioni di impermeabilizzazione, tenuta all'aria e isolamento agli agenti atmosferici della finestra. Le guarnizioni sono elementi performenti di natura polimerica che contribuiscono a migliorare la tenuta all'acqua e l'isolamento termoacustico e a ridurre lo sforzo di chiusura delle ante.

APPLICABILITÀ

Il miglioramento della tenuta all'aria del telaio mediante sigillatura o inserimento di quarnizioni è un tipo di operazione che più degli altri consente di mantenere invariate le caratteristiche estetiche originarie del serramento. È dunque la più idonea per il restauro conservativo di edifici storici di valore storico-artistico. In ogni caso, è necessaria una valutazione dello stato di conservazione della finestra esistente per definire la fattibilità tecnica e la convenienza economica dell'intervento.

VANTAGGI / SVANTAGGI / RISCHI

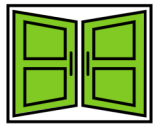
La riduzione delle infiltrazioni naturali d'aria può raggiungere il 90%, migliorando il comfort termico e la qualità dell'aria interna. Si tratta di un intervento semplice e poco costoso da effettuare sul patrimonio edilizio esistente. Nei serramenti esistenti le prestazioni inziali decadono con il tempo, specialmente in presenza di problemi di degrado, malfunzionamento o aperture ripetute dell'infisso. È necessario controllare periodicamente lo stato di conservazione e le infiltrazioni d'aria mediante la stesura di un piano di manutenzione.

SINERGIE E INTERAZIONI

L'intervento è conveninte con vetrazioni dotate di buon insolamento termico e telai in buono stato di conservazione e funzionamento, o se combinati con interventi di sostituzione della vetratura o di inserimento di pellicole basso-emissive. Per i sigillanti, la scelta del materiale dipende dal tipo di giunto da realizzare, il substrato di applicazione e le collecitazioni del sistema; è necessario verificare la compatibilità fisica tra i materiali di realizzazione e i sigillanti. Le guarnizioni possono essere realizzate con materiale elastomerico o plastomeriche. Risultati ancora migliora per l'isolamento termico si ottengono con guarnizioni perimetrali auto-gonfianti, che aumentano la tenuta all'aria. La tenuta all'aria deve essere verificata periodicamente mediante la definizione di un programma di manutenzione verificando: l'integrità della vetrazione esistente; la corretta chiusura, complanarità e sigillatura della giunzione fra il telaio fisso e mobile; la corretta chiusura di battenti ed ante; lo stato di sigillanti e guarnizioni esistenti; il corretto funzionamento dei chiavistelli e degli elementi di chiusura.

NORMATIVA DI RIFERIMENTO

D.lgs 311.2006, UNI EN 14351-1:2010, UNI EN ISO 10077

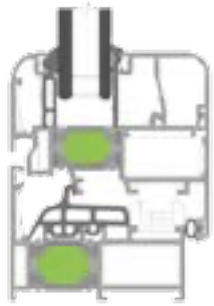


CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B - M
AZIONI isola
capta

SOLUZIONE CONFORME



In. 14 APPLICAZIONE AL VETRO DI PELLICOLE SPECIALI ISOLANTI O CAPTANTI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di pellicole speciali isolanti o captanti (basso emissive/selettive) per migliorare la resistenza termica del vetro e diminuire le dispersioni per trasmissione attraverso l'involucro trasfarente. L'inserimento di una pellicola basso-emissiva, costituita da un deposito di alluminio vaporizzato, consente di aumentare la prestazione termica del vetro riducendo le dispersioni per irraggiamento solare. Il rivestimento metallico riflette la radiazione infrarossa verso l'interno, limitando la dissipazione del calore e mantenendo le condizioni di comfort termico del'utente. Deve essere inserito nella facciata più interna del serramento.

APPLICABILITÀ

L'inserimento di una pellicola speciale è un tipo di operazione che consente di mantenere invariate le caratteristiche estetiche originarie del serramento, poiché la pellicola è trasparente. È dunque la più idonea per il restauro conservativo di edifici storici di valore storico-artistico. In ogni caso, è necessaria una valutazione dello stato di conservazione della finestra esistente per definire la fattibilità tecnica e la convenzienza economica dell'intervento.

VANTAGGI / SVANTAGGI / RISCHI

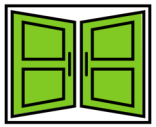
Le pellicole di nuova concentrazione riducono le perdite di calore verso l'esterno fino al 30% e durante i mesi estivi riducono il calore solare fino al 70% e l'abbigliamento fino del 80%. Allo stato attuale della ricerca, il beneficio energetico apportato è troppo limitato peer rendere l'operazione conveniente, poichè la dispersione del calore dall'interno rappresenta solo una componente di perdita del calore totale di un edificio. Tuttavia in caso di edifici di valore storico-artistico può rappresentare una buona soluzione di compromesso, se abbinata con la sigillatura delle infiltrazioni. la posa della pellicala deve essere eseguita da personale tecnico specializzato: una non corretta applicazione, di compatibilità chimico-fisica tra pellicola e adesivo e di durabilità della pellicola. La manutenzione deve essere effettuata con tecniche e prodotti compatibili con la resistenza chimica, fisica e meccanica del materiale.

SINERGIE E INTERAZIONI

La convenienza economica dell'intervento aumenta con la presenza di una doppia vetrazione costituita da vetri float, di telai con buone prestazioni di isolamento termico e l'assenza di infiltrazioni d'aria provenienti dalla giunzione tra vetrazione e telaio, telaio fisso e mobile, finestra e vano murario. Potrebbe essere necessaria la combinazione con interventi di isolamento e sigillatura delle infiltrazioni del telaio.

NORMATIVA DI RIFERIMENTO

D.lgs 311.2006, UNI EN 14351-1:2010, UNI EN ISO 10077



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B - M
AZIONI isola
capta

SOLUZIONE CONFORME

In. 15 MECCANIZZAZIONE DEL SERRAMENTO ESISTENTE O DEL NUOVO SERRAMENTO

PRINCIPIO DI FUNZIONAMENTO

La meccanizzazione del serramento esistente o del nuovo serramento, è un intervento mirato alla regolazione della ventilazione naturale. Consente la gestione da parte dell'utente dell'immissione e/o l'estrazione di aria sotto la spinta di differenze di pressione generate essenzialmente da differenze di temperatura tra interno e esterno e dall'azione del cento. Ciò che normalmente avviene in modo non controllato attraverso porte, finestra e cassonetti, può essere favorito o inibito in funzione di precise scelte progettuali relative alla tipologia e alla disposizione di infissi, condotti, camini, punti di immissione ed emissione. È possibile aumentare la ventilazione naturale attraverso l'uso di dispositivi di apertura meccanici controllati da sensori di anidride carbonica, vapore d'acqua e/o sulla scorta di imput di tipo termico provenienti da sensori di temperatura e di pressione. L'apertura e/o la chiusura in comando remoto e domotica di questi dispositivi, su impulso di precisi input di qualità dell'aria e di temperatura e pressione rende la ventilazione naturale, se correttamente progettata, è una modalità di controllo del benessere indorr: efficace, poco invasiva ed energeticamente molto efficiente.

APPLICABILITÀ

I sistemi di apertura meccanizzata dei serramenti sono compatibili con edifici privi di vincoli sulle aperture. In alternativa è possibile operare la meccanizzazione delle apertura di cavedi esistenti o l'installazione di cavedi di nuova progettazione. Molti edifici storici hanno impliciti dispositivi di ventilazione spesso in disuso, che possono essere rimessi in attivazione dotandoli di controllo intelligente remoto.

VANTAGGI / SVANTAGGI / RISCHI

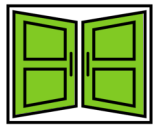
I sistemi di ventilazione naturale controllata permettono di regolare il comfort termo-igrometrico e ventilativo degli ambienti interni di un edificio. Inoltre, in ambienti con basso affollamento, si è in grado di controllare la concentrazione di vapore e quindi di evitare la possibilità di condense e formazioni di colonie fungine e muffe con conseguenti problemi estetici e di igiene. La ventilazione naturale ha importanza anche da un punto di vista della sicurezza e dell'antincendio poichè limita la formazione di concentrazioni di gas infiammabili o esplosive o asfissianti e di composti chimici. Rispetto all'installazione di un impianto di ventilazione meccanica controllata, il consumo di energia è legato solamente alla meccanizzazione delle aperture, mentre non avviene nessun pretrattamento dell'aria.

SINERGIE E INTERAZIONI

La quantità di aria immessa si deve confrontare con la permeabilità all'aria degli infissi e la messa in opera di telai con microventilazione interna, o con l'apertura volontaria, manuale o meccanizzata di condotti e bocche di presa degli impianti di ventilazione e camini di ventilazione o l'eventuale installazione d'impianti di ventilazione meccanica controllata (VMC). La qualità e la temperatura dell'aria, in assenza di pretrattamento, può essere controllata tramire il raffrescamento evaporativo con sistemi esterni vegetali o vaporizzatori idrici per la caduta d'aria.

NORMATIVA DI RIFERIMENTO

UNI EN 15251:2008, UNI 10339



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B - M
AZIONI isola
capta

SOLUZIONE CONFORME

In. 16 APPLICAZIONE AL VETRO DI PELLICOLE A CONTROLLO SOLARE

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di pellicole a controllo solare per ridurre il guadagno termico attraverso l'involucro trasparente. La trasmissione luminosa del vetro e della pellicola deve essere tale da garantire il comfort visivo dell'utente, mantenendo un Fattore di luce diurna (FLD) superiore al 2%. Le pellicole possono essere di due tipi: film riflettente, con colore argentato e leggermente a specchio, da applicare sulla lastra esterna; film semi-riflettente e leggermente oscurante, da applicare sulla lastra interna perchè meno resistente alla intemperie e all'acidità ambientale.

APPLICABILITÀ

L'inserimento di una pellicola speciale è un tipo di operazione che più degli altri consente di mantenere invariate le caratteristiche estetiche originarie del serramento, poichè la pellicola è trasparente. È tra le soluzioni più idonee per il restauro conservativo di edifici storici con serramenti di valore storico-artistico. In ogni caso, è necessaria una valutazione dello stato di conservazione della finestra esistente per definire la fattibilità tecnica e la convenienza economica dell'intervento. Poiché blocca quasi totalmente la componente ultravioletta, è particolarmente indicata per edifici che contengono oggetti di elevato pregio artistico. È importante valutare la resa cromatica della pellicola secondo la funzione dell'edificio.

VANTAGGI / SVANTAGGI / RISCHI

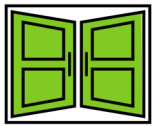
L'inserimento di una pellicola a controllo solare riduce la trasmissione luminosa del vetro in modo significativo (50-60%): sebbene consenta una riduzione quasi totale della radiazione ultravioletta, e un'ostruzione abbastanza buona della componente infrarossa, lascia passare quasi tutta la banda del visibile. Le pellicole hanno resistenze meccaniche, chimiche e di durabilità diverse in relazione al tipo di deposito superficiale: ne va valutata la convenienza di volta in volta.
La posa della pellicola deve essere eseguita da personale tecnico specializzato: una non corretta applicazione potrebbe generare problemi di aderenza e uniformità del collante, di compatibilità chimico-fisica tra pellicola e adesivo e di durabilità della pellicola. La manutenzione deve essere effettuata con tecniche e prodotti compatibili con la resistenza chimica, fisica e meccanica del materiale.

SINERGIE E INTERAZIONI

La convenienza economica dell'intervento aumenta con la presenza di una doppia vetrazione costituita da vetri float, di telai con buone prestazioni di isolamento termico e l'assenza di infiltrazioni d'aria provenienti dalla giunzione tra vetrazione e telaio, telaio fisso e mobile, finestra e vano murario. Potrebbe essere necessario la combinazione con interventi di isolamento e sigillatura delle infiltrazioni del telaio.

NORMATIVA DI RIFERIMENTO

UNI TS 11300-1:2008, D. lgs 311.2006



CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : B
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B
AZIONI isola
capta

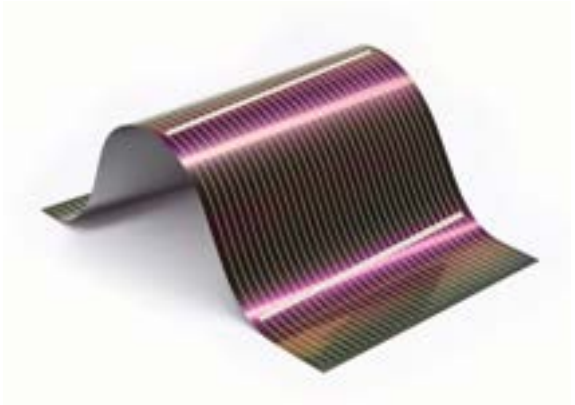
SOLUZIONE CONFORME

PELLICOLA A CONTROLLO SOLARE

DATI TECNICI MEDI IN COMMERCIO

POTENZA DI PICCO
170 Watt di energia
DIMENSIONI
a richiesta
SPESSORE
0,5 cm
POTENZA IMPIANTO
1 kWp
QUANTITÀ MODULI
-
COPERTURA
9 mq
PREZZO AL MQ
780 €

SOLUZIONE CONFORME



MODALITÀ DI POSA

Pianificazione e misurazione:
- Determinare l'area esatta in cui installerai la pellicola fotovoltaica.
- Misurare l'area per calcolare la quantità di pellicola necessaria.
- Verificare l'angolo di inclinazione ottimale in base alla tua posizione geografica per massimizzare l'efficienza della pellicola.

Preparazione della superficie:
- Pulire accuratamente la superficie di montaggio per rimuovere polvere, sporco e detriti.
- Assicurarsi che la superficie sia uniforme e ben livellata.

Installazione delle staffe di montaggio:
- Fissare le staffe di montaggio sulla superficie, assicurandoti che siano robuste e resistenti alle intemperie.
- Posizionare le staffe in modo che corrispondano all'angolo di inclinazione desiderato.

Montaggio della pellicola fotovoltaica:
- Srotolare con attenzione la pellicola fotovoltaica sulla superficie di montaggio, seguendo le linee guida del produttore.
- Assicurarsi che la pellicola sia tesa e senza grinze.

Cablaggio e connessioni:
- Collegare i cavi della pellicola fotovoltaica in modo corretto ai regolatori di carica e agli inverter solari, se necessario.
- Assicurarsi che le connessioni siano sicure e ben protette dalle intemperie.

Test e verifica:
- Eseguire test di funzionamento per verificare che la pellicola stia generando energia in modo adeguato.
- Verificare che non ci siano perdite di energia o problemi di cablaggio.

Manutenzione e pulizia:
- Periodicamente, pulire la pellicola fotovoltaica per rimuovere polvere, detriti e sporco che potrebbero ridurne l'efficienza.
- Ispezionare le connessioni e i cablaggi per eventuali segni di danni o corrosione.

Monitoraggio dell'efficienza:
- Utilizzare sistemi di monitoraggio dell'efficienza per tenere traccia della produzione di energia e rilevare eventuali problemi.

Sicurezza:
Assicurarsi di adottare misure di sicurezza adeguate durante l'installazione, come l'uso di dispositivi di protezione individuale (DPI) e l'evitare situazioni di pericolo.

Conformità normativa:
- Verifica permessi o autorizzazioni locali per l'installazione di pellicole fotovoltaiche.

In. 17 INSTALLAZIONE DI SCHERMI INTERNI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di sistemi di schermatura solare interni per ridurre il surriscaldamento e controllare l'abbagliamento visivo negli ambienti interni. A seconda dell'orientamento della zona climatica e dell'orientamento della facciata su cui sono applicati devono assumere caratteristiche progettuali differenti. Per ottimizzare l'efficienza energetica è opportuno montare il sistema in prossimità dei vetri. Nella progettazione del sistema è importante considerare: indice di trasmissione luminosa e il fattore solare del vetro; Openess Factor della schermatura; classe di resistenza al vento; resistenza meccanica; resistenza al fuoco. È importante inoltre scegliere il materiale di finitura delle schermature, valutandone trasparenza e rugosità che condizioneranno le caratteristiche di trasmissione e diffusione della luce solare nell'ambiente.

APPLICABILITÀ

L'installazione di un sistema interno di schermatura si integra bene con l'aspetto formale della facciata di un edificio, poichè si tratta di sistemi poco massicci in quanto non devono resistere ai caratteri atmosferici esterni. Generalmente non comporta problemi di fattibilità tecnica. È conveniente in climi caldi e temperati, su facciate esposte a Sud, Est o Ovest, in cui siano assenti altri tipi di protezione interna o esterna dai raggi solari.

VANTAGGI / SVANTAGGI / RISCHI

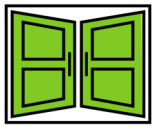
I sistemi interni risultano essere meno efficaci nel ridurre gli apporti termici estivi poichè intercettano la radiazione solare solo dopo il passaggio attraverso la superficie vetrata ed il surriscaldamento della stessa e dei locali interni. Non costituiscono un ulteriore strato per ridurre la dispersione termica dell'edificio. Sono dunque meno vantaggiosi di quelli esterni in termini di efficenza energetica, ma hanno un minore impatto sull'estetica della facciata esterna ed interna, essendo costituiti da materiali di minore impatto visivo. Hanno inoltre costi ridotti. I vantaggi e svantaggi di un sistema di schermatura vanno valutati caso per caso a seconda delle caratteristiche del sistema.

SINERGIE E INTERAZIONI

Nella valutazione della convenzienza di un sistema di schermatura interna, occorre verificare le caratteristiche energetiche e di trasparenza del vetro, la presenza di eventuali pellicole di controllo solare o di schermature interne, e la presenza di sistemi di schermatura nell'intorno dell'edificio. Alcuni sistemi possono interferire con il comfort visivo dell'utente, mentre altri lo migliorano riducendo i contrasti di luminanza e i fenomeni di abbagliamento. È necessario controllare le caratteristiche di trasparenza delle chiusure trasparenti.

NORMATIVA DI RIFERIMENTO

UNI TS 11300-1:2008, D. lgs 311.2006

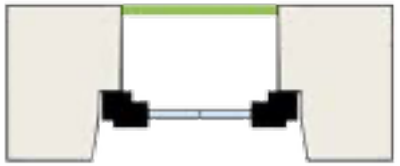


CHIUSURE TRASPARENTI

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B
AZIONI isola

SOLUZIONE CONFORME



In. 18 INSTALLAZIONE DI SCHERMI ESTERNI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di sistemi di schermatura solare esterni per ridurre il surriscaldamento e controllare l'abbagliamento visivo negli ambienti interni. Contibuiscono altresì la riduzione delle dispersioni termiche invernali poichè costituiscono un ulteriore strato di protezione e creano un'intercapedina areata tra schermante e involucro. A seconda dell'orientamento della zona climatica e dell'orientamento della facciata su cui sono applicati devono assumere caratteristiche progettuali differenti. Nella progettazione del sistema è importante considerare: indice di trasmissione luminosa e il fattore solare del vetro; Openess Factor della schermatura; classe di resistenza al vento; resistenza meccanica; resistenza al fuoco. Le schermature si distinguono per modalità di gestione (sistemi fissi o mobili, manuali o meccanizzati) sostanzialmente dipendenti dalla destinazione d'uso dell'edificio, e per geometria (orizzontali, verticali, inclinata) in risposta all'esposizione della facciata e quindi all'inclinazione dei raggi solari incidenti.

APPLICABILITÀ

L'installazione di un sistema esterno comporta un intervento significativo sull'aspetto formale della facciata di un edificio. È dunque importante valutarne i caratteri estetici e storici, la compatibilità strutturale e meccanica dell'involucro che deve sostenere il peso della schermatura. Il sistema in sé deve garantire idonee prestazioni di resistenza meccanica agli agenti atmosferici, sicurezza anti-effrazione e facilità di utilizzo e manutenibilità. È conveniente in climi caldi e temperati, su facciate esposte a Sud, Est o Ovest, prestando attenzione alla destinazione d'uso degli ambienti interni.

VANTAGGI / SVANTAGGI / RISCHI

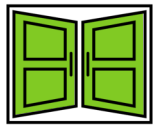
Risultano essere i più efficaci nel ridurre gli apporti termici estivi poichè intercettano la radiazione solare prima che questa incida sulla superficie vetrata surriscaldandone la superficie e i locali interni. Tuttavia hanno un maggiore impatto sull'estetica della facciata esterna. I vantaggi e svantaggi vanno valutati caso per caso a seconda delle caratteristiche del sistema. Geometria: gli impianti orizzontali sono vantaggiosi per le facciate meriodionali, mentra quelli verticali sono più adatti ad est e ovest, dove i raggi solari sono sempre particolarmente inclinat rispetto allo zenit. Gestione: gli elementi fissi richiedono un dimensionamento specifico rispetto all'orientamento e alle dimensioni dell'ambiente e del serramento, hanno un'efficienza energetica inferiore ma maggiore resistenza e durabilità; gli elementi mobili garantiscono un miglior controllo del comfort termico e visivo, l'efficienza dei sistemi è maggiore in particolar modo se ottimizzata da una rete domotica.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza, occorre verificare le caratteristiche energetiche e di trasparenza del vetro, la presenza di eventuali pellicole di controllo solare o di schermature interne, e la presenza di sistemi di schermatura nell'intorno dell'edificio. Alcuni sistemi possono interferire con il comfort visivo dell'utente, mentre altri lo migliorano riducendo i contrasti di luminanza e i fenomeni di abbagliamento.

NORMATIVA DI RIFERIMENTO

UNI TS 11300-1:2008, D. lgs 311.2006



CHIUSURE OPACHE

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B
AZIONI isola

SOLUZIONE CONFORME

In. 19 INTRODUZIONE DI SISTEMI DI OMBREGGIAMENTO ALL'INTORNO DELL'EDIFICIO

PRINCIPIO DI FUNZIONAMENTO

Le strategie di controllo microclimatico esterno presentano un fattore di compatibilità estremamente elevato, poichè migliorano l'efficienza energetica della fabbrica senza alcuna trasformazione diretta; nondimeno, le qualità storico-artistiche dei contesti ambientali degli edifici richiedono un'integrazione anche dal punto di vista compositivo, morfologico ed estetico. I sistemi di ombreggiamento permettono all'ostruzione e riflessione della radiazione solare, riducendo i guadagni termici delle aree contigue all'edificio e, possibilmente, delle superfici dell'edificio stesso. A causa dei possibili fenomeni di re-irraggiamento, riflessione e assorbimento che possono interessare la radiazione solare all'interno di una complessa morfologia urbana, è necessaria una valutazione dei meccanismi di protezione solare che ne ottimizzi la forma, la posizione e il funzionamento per massimizzare la dispersione dell'energia verso la volta celeste sia durante il giorno, tramite la riflessione della radiazione diretta, che durante la notte, grazie all'apertura dello spazio verso l'atmosfera a temperatura minore.
Le schermature dello spazio aperto si distinguono in naturali e artificiali, oppure in sistemi orizzontali. maggiormente efficaci per schermare i raggi solari provenienti da sud, con un angolo di incidenza elevato nel periodo estivo, o verticali, indicati per la protezione dei bassi raggi provenienti da est o ovest.

APPLICABILITÀ

I sistemi vegetali sono particolarmente efficaci in quanto utilizzano la porzione di radiazione solare assorbita per i propri cicli metabolici e i processi di evapo-traspirazione, sottraendo all'aria calore latente evaporativo senza aumento sensibile della propria temperatura, a fronte di un incremento dell'umidità relativa dell'ambiente. I sistemi artificiali di schermatura sono generalmente meno efficaci di quelli naturali, perchè rimettono sotto forma di calore parte dell'energia solare assorbita. In base al meccanismo d'uso si distinguono sistemi di schermatura fissi e mobili. I primi, solitamente meno onerosi in termini di manutenzione e più durevoli, limitano la flessibilità dell'area; i secondi, molto variabili, consentono di ottimizzare guadagni termici e dispersioni stagionali e giornaliere.

VANTAGGI / SVANTAGGI / RISCHI

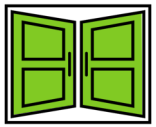
I sistemi naturali sono maggiormente onerosi in termini economici e di gestione; per ragioni di ottimizzazione, dunque, si raccomanda l'utilizzo di specie autoctone, che fasano la crescita e il ciclo di foliazione con il clima; solitamente, è anche opportuno impiegare specie caducifoglie, che ottimizzano il comportamento estivo e invernale dello spazio. I sistemi artificiali possono essere maggiormente economici e semplici da mettere in opera e possono integrarsi con la morfologia e con il sistema compositivo dello spazio.

SINERGIE E INTERAZIONI

I sistemi di imbreggiamento all'intorno possono integrarsi con le schermature integrate con l'edificio, sia interne, che esterne.

NORMATIVA DI RIFERIMENTO

UNI TS 11300-1:2008, D. lgs 311.2006



INTORNO DELL'INVOLUCRO EDILIZIO

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B
AZIONI isola

SOLUZIONE CONFORME

In. 20 INSTALLAZIONE DI UNA MENSOLA DI LUCE - "LIGHTSHELF"

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di una mensola di luce (lightshelf) per schermare la radiazione solare e contemporaneamente illuminare in profondità l'ambiente interno. La mensola è un elemento di imbreggiamento fisso interno o esterno, inserito ad un'altezza superiore rispetto al cono visivo dell'utente, che divide in due la finestra. La superficie superiore della mensiola è rivestita con materiale riflettente che permette la riflessione diretta e diffusa dell'illuminazione naturale verso il soffitto dell'ambiente e di seguito verso il locale. La mensola funge anche da sistema di schermatura per la parte inferiore della finestra, impedendo il passaggio dei raggi estivi caratterizzati da grande inclinazione.

APPLICABILITÀ

L'installazione di una mensola di luce comporta un intervento significatico sull'aspetto formale della facciata di un edificio. È dunque importante valutarne i caratteri estetici e storici. È inoltre importante valutare la compatibilità strutturale e meccanica dell'involucro che deve sostenere il peso della mensola. È conveniente in climi caldi e temperati in presenza di ambienti caratterizzati da una elevata profondità, su facciate di scarso valore artistico o in forte stato di degrado esposte a sud, in cui siano assenti altri tipi di protezione interna o esterna dai raggi solari, prestando attenzione alla destinazione d'uso degli ambienti interni.

VANTAGGI / SVANTAGGI / RISCHI

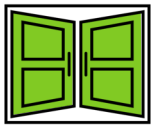
I lightshelves favoriscono la penetrazione della luce in profondità, evitando la formazione di abbagliamento visivo e riflesso, fornendo luce diffuda ed evitando il surriscaldamento termico attraverso la vetrazione. Consentono una distribuzione uniforme della luce naturale nell'ambiente. L'efficacia del sistema è legata alle condizioni metereologiche: solo nei giorni di cielo sereno il funzionamento sarà ottimizzato. La mensola deve essere regolarmente mantenuta e pulita al fine di preservare l'efficacia della riflettanza delle superfici. È inoltre necessaria una simulazione del comportamento energetico, luminoso e illuminotecnico per valutare la convenienza del sistema.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza di un sistema di mensole di luce, occorre verificare le caratteristiche energetiche del vetro, la presenza di eventuali pellicole di controllo solare o di schermature interne, e la presenza di sistemi di schermatura nell'intorno dell'edificio. Il funzionamento è ottimizzato dalla presenza di pareti interne rivestite con colori chiari e riflettenri. L'inserimento di una mensola può comportare la sostituzione dell'intero serramento.

NORMATIVA DI RIFERIMENTO

UNI TS 11300-1:2008, D. lgs 311.2006



CHIUSURE TRASPARENTI

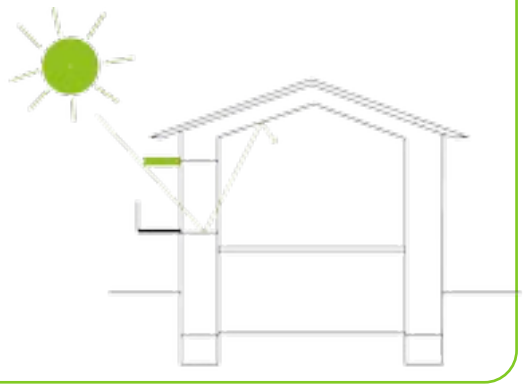
adeguamento superficiale

COMPATIBILITÀ : B - M
REVERSIBILITÀ : B - M
INVASIVITÀ : M - A
AZIONI isola, capta

COLORE VETRO

INCOLORE

SOLUZIONE CONFORME



In. 21 REALIZZAZIONE DI UNA SERRA SOLARE

PRINCIPIO DI FUNZIONAMENTO

La serra costituisce generalmente un volume edilizio chiuso da una o più pareti trasparenti contiguo agli spazi interni fruiti dell'edificio, dotato di massa d'accumulo che garantisce l'attenuazione e lo sfasamento dei picchi termici esterni. In maniera differenziata a seconda delle stagioni, funziona come un filtro climatico per stabilizzare la temperatura interna, migliorare l'efficienza energetica e il comfort degli utenti. In inverno, durante il giorno agisce come captatore e accumulatore della radiazione solare per riscaldare gli ambienti dell'edificio, mentra di notte minimizza le dispersioni per trasmissione dell'involucro edilizio. In estate la presenza di sistemi di schermatura e l'apertura totale delle finestre permette l'ombreggiamento, la ventilazione e il raffrescamento dell'ambiente. Nelle notti estive, l'apertura delle finestre crea dei moti d'aria interni, permettendo il raffrescamento sotto forma di scambio radiativo e convettivo delle masse termiche. In base al posizionamento della serra rispetto all'ambiente da riscaldare al tipo di trasferimento e distribuzione del calore, le tipologie si distinguono in: serra a scambio convettivo (sfruttano lo scambio di convezione tra serra e ambiente interno, attraverso finestra regolabili inserite nella parete di separazione) e serra a scambio radiativo (sfruttano lo scambio di calore radiante tra la parete di accumulo non isolata e l'ambiente interno).

APPLICABILITÀ

Comporta un intervento significativo sull'aspetto formale della facciata di un edifici. È dunque importante valutare i vincoli ed i caratteri estetici e storici, la compatibilità strutturale e meccanica dell'involucro che deve sostenere il peso del sistema. È conveniente in climi caldi e temperati su facciate esposte a Sud, Est o Ovest, analizzando latitudine e orientamento della facciata, temperatura media dell'aria esterna e interna dell'ambiente adiacente alla serra, irradianza globale e intensità del vento, ombraggiamento della serra e modalità d'uso degli utenti.

VANTAGGI / SVANTAGGI / RISCHI

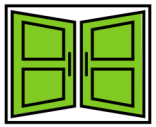
La serra funziona come un filtro climatico per stabilizzare la temperatura interna, migliorare l'efficienza energetica e il comfort degli utenti. Un sistema correttamente progettato è in grado di minimizzare dispersioni invernali, massimizzare la radiazione captata in inverno, proteggere dalla radiazione estiva, massimizzare le perdite di carico in estate con ventilazione, con conseguenti benefici di risparmio energetico e benessere ambientale. Consente, inoltre, di ottenere benefici architettonici sia in termini di ampliamento dell'edificio, si in termini di ripensamento dell'utilizzo degli ambienti, consentito dalle nuove prestazioni.

SINERGIE E INTERAZIONI

È possibile bilanciare le esigenze usando diverse tipologie di vetrazione e schermatura e utilizzando serramenti completamente apribili, che combinino trasmissione luminosa, trasmittanza termica e fattore solare. Il dimensionamento della massa termica è funzione della quantità di radiazione solare incidente e dei tempi di accumulo e rilascio del calore dei materiali. Lo scambio di tipo convettivo tra serra e ambiente interno può essere ottimizzato da elettroventole comandate da un termostato, alla base e alla sommità della separazione.

NORMATIVA DI RIFERIMENTO

UNI EN ISO 13790:2008

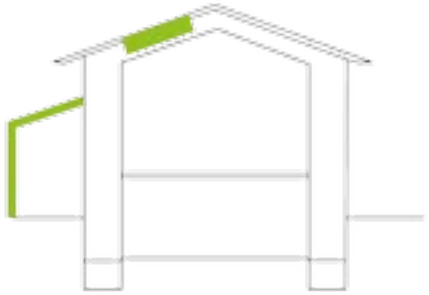


INTORNO DELL'INVOLUCRO EDILIZIO

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B
AZIONI isola

SOLUZIONE CONFORME



In. 22 SCHERMATURE SOLARI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di sistemi di schermatura solare esterni per ridurre il surriscaldamento e controllare l'abbagliamento visivo negli ambienti interni. Contribuiscono altrsì alla riduzione delle dispersioni termiche invernali poichè costituiscono un ulteriore strato di protezione e creano un'intercapedine areata tra schermate e involucro. A seconda dell'orientamento della zona climatica e dell'orientamento della facciata su cui sono applicati devono assumere caratteristiche progettuali differenti. Nella progettazione del sistema è importante considerare: indice di trasmissione luminosa e il fattore solare del vetro; Openness Factor della schermatura; classe di resistenza al vento; resistenza meccanica; resistenza al fuoco. Le schermature si distinguono per modalità di gestione (sistemi fissi o mobili, manuali o meccanizzati) sostanzialmente dipendenti dalla destinazione d'uso dell'edificio, e per geometria (orizzontali, verticali, inclinata) in risposta all'esposizione della facciata e, quindi, all'inclinazione dei raggi solari incidenti.

APPLICABILITÀ

L'installazione di un sistema esterno comporta un intervento significativo sull'aspetto formale della facciata di un edificio. È dunque importante valutarne i caratteri estetici e storici, la compatibilità strutturale e meccanica dell'involucro che deve sostenere il peso della schermatura. Il sistema in sé deve garantire idonee prestazioni di resistenza meccanica agli agenti atmosferici, sicurezza anti-effrazione e facilità di utilizzo e manutenibilità. È conveniente in climi caldi e temperati, su facciate esposte a Sud, Est o ovest, prestando attenzione alla destinazione d'uso degli ambienti interni.

VANTAGGI / SVANTAGGI / RISCHI

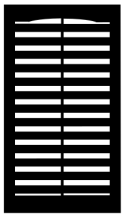
Risultano essere i più efficaci nel ridurre gli apporti termici estivi pioché intercettano la radiazione solare prima che questa incida sulla superficie vetrata surriscaldandone la superfici e i locali interni. Tuttavia hanno un maggiore impatto sull'estetica della facciata esterna. I vantaggi e svantaggi vanno valutati caso per caso a seconda delle caratteristiche del sistema. Geometria: gli impianti orizzontali sono vantaggiosi per le facciare meridionali, mentre quelli verticali sono più adatti ad est e ovest, dove i raggi solari sono sempre particolarmente inclinati rispetto allo zenit. Gestion: gli elementi fissi richiedono un dimensionamento specifico rispetto all'orientamento e alle dimensioni dell'ambiente e del serramento, hanno un'efficienza energetica inferiore, ma maggiore resistenza e durabilità; gli elementi mobili garantiscono un miglior controllo del comfort termico e visivo, l'efficienza dei sistemi è maggiore in particolar modo se ottimizzata da una rete domotica.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza, occorre verificare le caratteristiche energetiche e di trasparenza del vetro, la presenza di eventuali pellicole di controllo solare o di schemature interne. La presenza di sistemi di sistemi di schermatura nell'intorno dell'edificio. Alcuni sistemi possono interferire con il comfort visivo dell'utente, mentre altri lo migliorano riducendo i contrasti di luminanza e i fenomeni di abbagliamento.

NORMATIVA DI RIFERIMENTO

UNI 13659



CHIUSURE OPACHE

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B - M - A
INVASIVITÀ : B
AZIONI isola

SOLUZIONE CONFORME

In. 23 VENEZIANE FOTOVOLTAICHE

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di sistemi di schermatura solare esterni per ridurre il surriscaldamento e controllare l'abbagliamento visivo negli ambienti interni. Contribuiscono altrsì alla riduzione delle dispersioni termiche invernali poichè costituiscono un ulteriore strato di protezione e creano un'intercapedine areata tra schermate e involucro. A seconda dell'orientamento della zona climatica e dell'orientamento della facciata su cui sono applicati devono assumere caratteristiche progettuali differenti. Nella progettazione del sistema è importante considerare: indice di trasmissione luminosa e il fattore solare del vetro; Openness Factor della schermatura; classe di resistenza al vento; resistenza meccanica; resistenza al fuoco. Le schermature si distinguono per modalità di gestione (sistemi fissi o mobili, manuali o meccanizzati) sostanzialmente dipendenti dalla destinazione d'uso dell'edificio, e per geometria (orizzontali, verticali, inclinata) in risposta all'esposizione della facciata e, quindi, all'inclinazione dei raggi solari incidenti.

APPLICABILITÀ

L'installazione di un sistema esterno comporta un intervento significativo sull'aspetto formale della facciata di un edificio. È dunque importante valutarne i caratteri estetici e storici, la compatibilità strutturale e meccanica dell'involucro che deve sostenere il peso della schermatura. Il sistema in sé deve garantire idonee prestazioni di resistenza meccanica agli agenti atmosferici, sicurezza anti-effrazione e facilità di utilizzo e manutenibilità. È conveniente in climi caldi e temperati, su facciate esposte a Sud, Est o ovest, prestando attenzione alla destinazione d'uso degli ambienti interni.

VANTAGGI / SVANTAGGI / RISCHI

Risultano essere i più efficaci nel ridurre gli apporti termici estivi pioché intercettano la radiazione solare prima che questa incida sulla superficie vetrata surriscaldandone la superfici e i locali interni. Tuttavia hanno un maggiore impatto sull'estetica della facciata esterna. I vantaggi e svantaggi vanno valutati caso per caso a seconda delle caratteristiche del sistema. Geometria: gli impianti orizzontali sono vantaggiosi per le facciare meridionali, mentre quelli verticali sono più adatti ad est e ovest, dove i raggi solari sono sempre particolarmente inclinati rispetto allo zenit. Gestion: gli elementi fissi richiedono un dimensionamento specifico rispetto all'orientamento e alle dimensioni dell'ambiente e del serramento, hanno un'efficienza energetica inferiore, ma maggiore resistenza e durabilità; gli elementi mobili garantiscono un miglior controllo del comfort termico e visivo, l'efficienza dei sistemi è maggiore in particolar modo se ottimizzata da una rete domotica.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza, occorre verificare le caratteristiche energetiche e di trasparenza del vetro, la presenza di eventuali pellicole di controllo solare o di schemature interne. La presenza di sistemi di sistemi di schermatura nell'intorno dell'edificio. Alcuni sistemi possono interferire con il comfort visivo dell'utente, mentre altri lo migliorano riducendo i contrasti di luminanza e i fenomeni di abbagliamento.

NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017

CHIUSURE OPACHE

adeguamento superficiale

COMPATIBILITÀ : A
REVERSIBILITÀ : M - A
INVASIVITÀ : B
AZIONI isola

SOLUZIONE CONFORME

In. 24 PANNELLI FOTOVOLTAICI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede l'inserimento di pannelli fotovoltaici in copertura che sfruttano le radiazioni solari per produrre elettricità. Più celle fotovoltaiche collegate tra di loro, costituite da silicio, capaci di convertire i fotoni, attraverso una reazione fisica, in un campo elettrico in corrente continua. ne esistono svariate tipologie, che assicurano una diversa efficienza di conversione di energia solare in energia elettrica:

• i pannelli fotovoltaici in silicio monocristallino sono i più performanti, arrivando a trasformare dal 15% fino al 20% di energia solare in elettricità. Ogni cella viene ricavata da un unico cristallo di silicio. Il processo di produzione è piuttosto laborioso, e questo determina un costo solitamente maggiore;

• i pannelli fotovoltaici in silicio policristallino sono i più comuni, e vengono realizzati attraverso una gettata di silicio fuso. Meno costosi rispetto al monocristallino, sono anche meno efficienti (14%-16%);

• i pannelli fotovoltaici a film sottile, sono realizzati da pellicole sottili di diversi materiali, come il silicio amorfo (a-Si), il tellururo di cadmio (CdTe) e il seleniuro di indio e gallio di rame (CIS / CIGS). Garantiscono un'efficienza di conversione minore (tra il 6 e il 10%), ma hanno il vantaggio di minori costi di produzione e una versatilità maggiore, poiché più flessibili e leggeri (possono ad esempio rivestire intere facciate o elementi architettonici irregolari).

APPLICABILITÀ

L'installazione di un sistema esterno comporta un intervento significativo sull'aspetto formale della facciata di un edificio. È dunque importante valutarne i caratteri estetici e storici, la compatibilità strutturale e meccanica dell'involucro che deve sostenere il peso della schermatura. Il sistema in sé deve garantire idonee prestazioni di resistenza meccanica agli agenti atmosferici, sicurezza anti-effrazione e facilità di utilizzo e manutenibilità. È conveniente in climi caldi e temperati, su facciate esposte a Sud, Est o ovest, prestando attenzione alla destinazione d'uso degli ambienti interni.

VANTAGGI / SVANTAGGI / RISCHI

Risultano essere i più efficaci nel ridurre gli apporti termici estivi pioché intercettano la radiazione solare prima che questa incida sulla superficie vetrata surriscaldandone la superfici e i locali interni. Tuttavia hanno un maggiore impatto sull'estetica della copertura. I vantaggi e svantaggi vanno valutati caso per caso a seconda delle caratteristiche del sistema. Vantaggi: zero emissioni, risparmio energetico, nessun rumore, compatibilità con altri tipi di energia e disponibilità.
Svantaggi: Investimento iniziale elevato, potenza limitata, dipendenza dai fattori meteorologici, medio-alto impatto ambientale in base alla colorazione.

SINERGIE E INTERAZIONI

Gli impianti color cotto sono preferibili in quanto facilmente camuffabili nel manto di coppi. Il sistema funziona meglio se collegato all'intero sistema di riscaldamento dell'edificio, anche per la produzione di ACS.

NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017

IMPLEMENTAZIONE TECNOLOGICA

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : M - A
INVASIVITÀ : M - A
AZIONI capta

SOLUZIONE CONFORME

INTEGRAZIONE ARCHITETTONICA PARZIALE

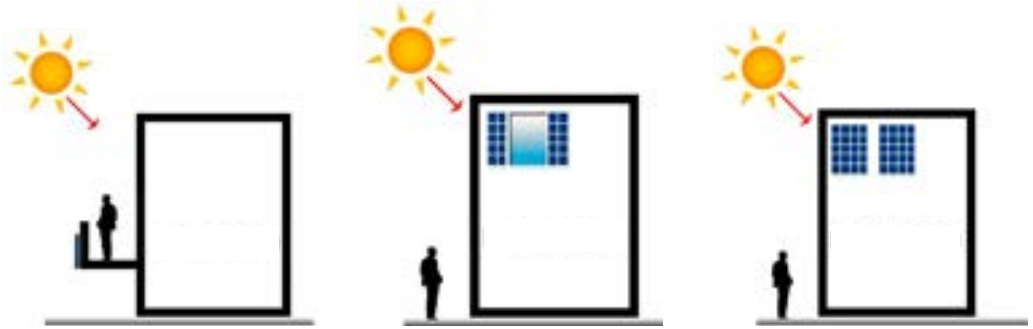
I moduli fotovoltaici possono essere installati su edifici o componenti di arredo urbano, quali chioschi, pensiline, barriere acustiche, e strutture simili, senza la necessità di sostituire i materiali da costruzione delle strutture preesistenti. Questa modalità di installazione, nota come integrazione architettonica parziale, offre un'opportunità significativa per coniugare efficienza energetica e rispetto delle strutture esistenti, permettendo così di sfruttare superfici già presenti senza alterare in modo invasivo l'aspetto originario degli edifici o degli elementi urbani.

Per ottenere un risultato armonioso tra i moduli fotovoltaici e i materiali già esistenti, è importante una progettazione attenta e accurata che consideri non solo la produzione energetica del sistema, ma anche il suo inserimento globale all'interno del contesto architettonico. Questo richiede una valutazione approfondita che tenga conto di diversi fattori, quali la congruità del posizionamento dei moduli, la loro estensione sulla superficie, l'impatto visivo e l'integrazione con gli altri elementi della copertura, della facciata o di qualunque altra superficie coinvolta: l'integrazione deve risultare il più possibile fluida e coerente, senza compromettere l'estetica o la funzionalità strutturale.

Risulta essenziale che l'installazione dei moduli fotovoltaici non alteri le caratteristiche estetiche e funzionali dell'involucro architettonico, poiché queste rivestono un ruolo cruciale non solo in termini di design ma anche per l'efficienza energetica complessiva dell'edificio. Trovare un equilibrio tra la necessità di ottimizzare la raccolta di energia solare e quella di preservare l'identità visiva e le prestazioni termiche dell'edificio.

1

2



RAPPORTO COLORE E PRESTAZIONI

I pannelli solari sono tradizionalmente disponibili in tonalità di nero, blu scuro o verde scuro; tuttavia, alcune aziende stanno attualmente sviluppando pannelli solari in una gamma più ampia di colori, inclusi tinte unita, fantasie e tonalità metalliche.

Quando i pannelli fotovoltaici vengono utilizzati come elementi costruttivi, è essenziale considerare gli aspetti estetici, poiché i colori possono influire sulla quantità di luce solare riflessa e, di conseguenza, sulla loro capacità di generare elettricità.

Le misurazioni dell'efficienza di conversione della potenza della cella (PCE) per vari colori mostrano una variazione compresa tra il 10,7% e il 14,2%, a seconda del colore e del tipo di rivestimento antiriflesso impiegato. Per sette diversi colori realizzati con un rivestimento antiriflesso a doppio strato, l'efficienza varia rispetto al 14,6% registrato per i colori scuri, con una perdita di potenza relativa compresa tra il 10% e il 27%. L'uso del rivestimento antiriflesso a doppio strato (DLAR) ha consentito anche la realizzazione di pannelli in quattro colori con PCE compresi tra il 16,1% e il 17,0%.

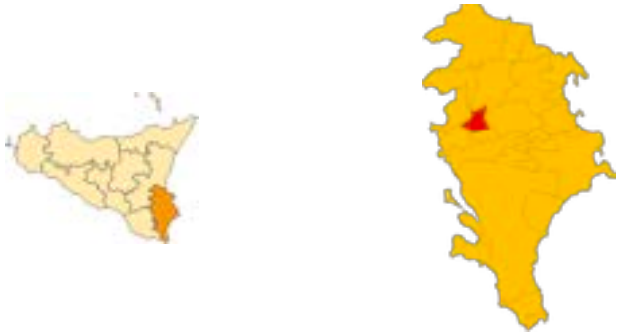
Con il continuo sviluppo della tecnologia, emergono nuove opzioni estetiche per i pannelli solari, offrendo scelte più varie per abitazioni e attività commerciali. È importante considerare che i colori più scuri assorbono maggiore calore; pertanto, la scelta di pannelli solari in colori più chiari può contribuire a mantenere una temperatura più fresca all'interno degli edifici durante le giornate particolarmente calde. Tuttavia, è fondamentale notare che un'installazione di pannelli solari colorati potrebbe non offrire gli stessi vantaggi prestazionali rispetto ai pannelli monocromatici.

Tra le opzioni di colore più popolari, oltre al tradizionale nero e blu scuro, vi sono i pannelli solari bianchi, verdi e rosso coppo. I pannelli solari bianchi sono frequentemente scelti per le aziende grazie al loro aspetto discreto, che si integra bene con la combinazione di colori esterni dell'edificio. I pannelli solari verdi, invece, sono particolarmente adatti per le aree caratterizzate da abbondante vegetazione, poiché si amalgamano meglio con l'ambiente circostante rispetto ai pannelli di colore bianco o nero. Infine, i pannelli solari rosso coppo sono spesso utilizzati in contesti storici o vincolati paesaggisticamente, grazie alla loro capacità di integrarsi armoniosamente con il paesaggio e ridurre l'impatto ambientale.

colore	n° celle	Pmax [Wp]	Eff. %
nero	60	340	18
blu	60	330	17
bianco	60	280	15
rosso	60	260	14
giallo	60	240	13
verde	60	220	12
marrone	60	200	11

FERLA prima comunità energetica in Sicilia

LOCALIZZAZIONE



DATI CLIMATICI

Zona climatica:
D

Temperature massime medie (°C):
21°C - 11°C

Venti prevalenti:
NO, NOX

POSIZIONAMENTO	TESSUTO
PAESE	STORICO

TIPOLOGIA DI INTERVENTO:
Efficientamento energetico di edifici comunali

LOCALIZZAZIONE:
Ferla, SR, Sicily

PROGETTISTI:
Energy Manager Comune di Ferla

DESTINAZIONE:
Immobili comunali

DATA IMPIANTO ORIGINALE:

ANNO INTERVENTO:
2021

COSTO INTERVENTO:
PO FESR 2007/2013 E POI ENERGIA 2015/2016

DESCRIZIONE INTERVENTO:
Applicazione di pannelli fotovoltaici in scuole, edifici del comune e campi sportivi

USO	PROMISCUITÀ
PUBBLICO	ADDOSSATO
TIPOLOGIA ANTE	TIPOLOGIA POST
PUBBLICO	PUBBLICO
MORFOLOGIA	CARATTERISTICHE ENERGETICHE
	POST: 6 IMPIANTI FOTOVOLTAICI PER UNA POTENZA DI 311 Kw RISPARMIO: 90.000 □ di risparmio energetico

INTERVENTI SULL'EDIFICIO

Intervento su edificio comunale

unità tecnologica: chiusura superiore	B	M	A
invadenza			x
reversibilità			x
compatibilità	x		

tipo di intervento: efficientamento energetico

materiale:
silicio policristallino color coppo

strategie

- contenimento termico
- accumulo termico
- captazione luminosa
- schermatura
- dispersione termica

Intervento su edificio comunale

unità tecnologica: chiusura superiore	B	M	A
invadenza			x
reversibilità			x
compatibilità	x		

tipo di intervento: efficientamento energetico

materiale:
silicio policristallino color coppo

strategie

- contenimento termico
- accumulo termico
- captazione luminosa
- schermatura
- dispersione termica

Intervento su edilizia scolastica

unità tecnologica: chiusura superiore	B	M	A
invadenza			x
reversibilità			x
compatibilità	x		

tipo di intervento: efficientamento energetico

materiale:
silicio policristallino color coppo

strategie

- contenimento termico
- accumulo termico
- captazione luminosa
- schermatura
- dispersione termica

In. 25 VETRI FOTOVOLTAICI

PRINCIPIO DI FUNZIONAMENTO

I vetri fotovoltaici, noti anche come vetri solari o finestre fotovoltaiche, sono dispositivi che utilizzano la tecnologia dei pannelli solari per convertire la luce solare in elettricità. Il loro principio di funzionamento è simile a quello dei tradizionali pannelli solari a celle fotovoltaiche.
I vetri fotovoltaici contengono celle fotovoltaiche sottili e trasparenti che sono integrate nel vetro stesso. Queste celle sono realizzate con materiali semiconduttori, spesso basati su silicio amorfo o altre tecnologie avanzate. Quando la luce solare colpisce il vetro fotovoltaico, le celle fotovoltaiche catturano la luce e la trasformano in energia elettrica utilizzando il processo di fotogenerazione, simile a quello dei tradizionali pannelli solari. L'energia elettrica generata dalle celle fotovoltaiche può essere utilizzata per alimentare dispositivi elettrici o immagazzinata in batterie per un uso futuro. Il vetro fotovoltaico in silicio amorfo offre isolamento sia termico che acustico.

APPLICABILITÀ

Le finestre fotovoltaiche possono essere integrate nell'architettura degli edifici per fornire energia pulita e ridurre la dipendenza dalla rete elettrica. Possono essere utilizzati come vetri da facciata in edifici commerciali o residenziali, fornendo al contempo l'isolamento termico e la generazione di energia. I vetri fotovoltaici possono essere utilizzati in applicazioni mobili, come frigoriferi solari o vetri per veicoli, per alimentare dispositivi o veicoli elettrici. Dal punto di vista meccanico, questo vetro fotovoltaico si comporta come qualsiasi altro vetro architettonico tradizionale, dato che può essere installato in qualsiasi parte nell'involucro di un edificio. Tuttavia, come valore aggiunto, genera elettricità pulita e gratuita per il proprietario, grazie alla quale può raggiungere il 100% del fabbisogno energetico dell'edificio in cui è integrato.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Personalizzazione con infiniti colori, diverse trasparenze e diverse finiture; Versatilità nella sua integrazione; Trasparenza e illuminazione naturale all'interno dell'edificio; Ottimale per condizioni di luce diffusa, applicazioni verticali e anche non orientato verso il sole; Generazione di energia. Riducono la dipendenza dalle fonti di energia non rinnovabile e contribuiscono alla produzione di energia pulita. Migliorano l'efficienza energetica degli edifici, riducendo i costi energetici. Possono essere progettati in vari stili e colori ed eliminano la necessità di pannelli solari aggiuntivi su tetto o terreno.
Svantaggi/Rischi: Sono generalmente più costosi rispetto ai vetri tradizionali. Possono avere un'efficienza leggermente inferiore rispetto ai pannelli solari tradizionali. Possono subire un degrado delle prestazioni nel tempo a causa di condizioni ambientali e di esposizione alla luce solare. L'installazione richiede competenze specializzate.

SINERGIE E INTERAZIONI

I vetri fotovoltaici possono essere integrati in un sistema più ampio di energie rinnovabili e architettura sostenibile. L'energia generata dai vetri può essere immagazzinata in batterie per un utilizzo continuo.
Possono essere collegati a sistemi di gestione energetica per massimizzare l'efficienza e l'autoconsumo.
Possono essere utilizzati in combinazione con vetri isolanti per migliorare ulteriormente l'efficienza energetica degli edifici.

NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017 - IEC 61215 e IEC 61646 - ISO 9050 - EN 17037 - EN 14449 - Decreto Ministeriale 26 settembre 2013, n. 79 - Decreto Legislativo 22 gennaio 2017, n. 17 - Decreto Legge 19 maggio 2022, n. 50

DISPOSITIVI CAPTAZIONE E.S.

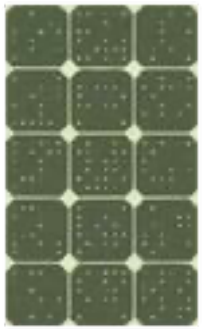
adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

INCOLORE

SOLUZIONE CONFORME



In. 26 COPPI FOTOVOLTAICI INVISIBILI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede lo smontaggio e la sostituzione dei coppi tradizionali esistenti con coppi fotovoltaici per la produzione di energia solare mantenendo inalterato l'aspetto estetico e la funzionalità della classica copertura in cotto. Ciascun modulo o coppo, generalmente, risulta formato con un composto polimerico atossico e riciclabile, che viene appositamente lavorato per incentivare l'assorbimento dei fotoni. All'interno del modulo sono incorporate delle normali celle di silicio monocristallino. La superficie, opaca alla vista e trasparente per i raggi solari, permette alla luce di entrare ed alimentare le celle invisibili.

APPLICABILITÀ

L'installazione del coppo si effettua con pochi e semplici passaggi. Il sistema è simile a quello utilizzato per i classici coppi in cotto e permette di sostituire la copertura esistente senza bisogno di strutture aggiuntive. È pratico da installare, non necessita di strutture aggiuntive e sostituisce i coppi di copertura esistenti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Il Coppo invisibile si distingue dalle altre tecnologie fotovoltaiche e dai classici coppi in cotto, grazie a particolari caratteristiche che lo rendono unico.

- INTEGRATO: Installato come un coppo in cotto, si mimetizza nella continutà estetica del tetto.
- FOTOCATALITICO: La luce attiva un processo naturale e infinito che purifica l'aria mentre pulisce la superficie del coppo.
- RESISTENTE: Può sopportare un elevato carico statico, non teme solventi chimici e agenti atmosferici.
- SOSTENIBILE: Realizzato con materiali atossici, anche naturali o da riuso, tutti riciclabili.

Svantaggi: Necessitano di continua manutenzione per valutare l'efficienza e l'efficacia, si consiglia il controllo a campione. La resa è poco inferiore rispetto ad un normale pannello fotovoltaico.

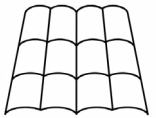
Rischi: La colorazione potrebbe risultare non esattamente fedele ai coppi originali, ma di un rosso leggermente più accentuato a causa della produzione al dettaglio.

SINERGIE E INTERAZIONI

Nella valutazione della convenienza, occorre verificare le caratteristiche energetiche, essendo prodotti a mano, infatti, necessitano di un controllo saltuario per la verifica del funzionamento. Il sistema funziona meglio se collegato all'impianto di riscaldamento per la produzione di calore e ACS.

NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017



DISPOSITIVI CAPTAZIONE E.S.

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

INCOLORE

TIPOLOGIA DI APPLICAZIONE

POSIZIONAMENTO NELL'INTERA COPERTURA

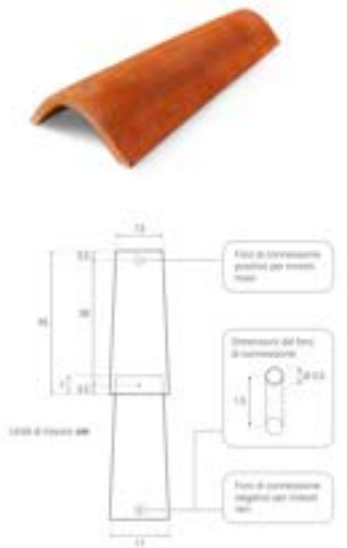
ESPOSIZIONE NELLA FALDA SUD

COPPO FOTOVOLTAICO INVISIBILE

DATI TECNICI DEL COPPO

POTENZA DI PICCO
7,5 Wp
DIMENSIONI
45 x 17 x 13 x 7h cm
PESO
2,0 Kg
TEMPERATURA DI FUNZIONAMENTO
- 40°C / + 85°C
PROTEZIONE
IP68
INFIAMMABILITÀ
HB
POTENZA IMPIANTO
1 kWp
QUANTITÀ MODULI
134 coppi
COPERTURA
9 mq
PREZZO AL MQ
780 €

SOLUZIONE CONFORME



MODALITÀ DI POSA

L'installazione di un tetto fotovoltaico invisibile è un'operazione relativamente semplice che può essere eseguita da un installatore qualificato. I passaggi da seguire sono i seguenti:

1. Preparazione del tetto
Il primo passo è la preparazione del tetto, che deve essere in buone condizioni e privo di crepe o danni. Se necessario, è opportuno eseguire delle riparazioni.

2. Installazione dei supporti
I supporti sono necessari per fissare i coppi fotovoltaici al tetto. Possono essere di diversi tipi, in base al tipo di tegola e al tipo di tetto.

3. Posa dei coppi fotovoltaici
I coppi fotovoltaici vengono posati in modo analogo alle tegole tradizionali. È importante seguire le istruzioni fornite dal produttore per garantire un'installazione corretta.

4. Connessione elettrica
I coppi fotovoltaici devono essere collegati alla rete elettrica per generare energia. Questa operazione deve essere eseguita da un elettricista qualificato.

5. Specifiche del processo di installazione
Sono disponibili in una varietà di forme e dimensioni per adattarsi a qualsiasi tipo di tetto. Sono realizzati con materiali durevoli e resistenti alle intemperie, in modo da garantire una lunga durata.
L'installazione può richiedere da poche ore a diversi giorni, a seconda della dimensione del tetto e della complessità dell'installazione.

Vantaggi dei tetti fotovoltaici invisibili

- Estetica: hanno l'aspetto delle tegole tradizionali, quindi non alterano l'aspetto estetico dell'edificio.
- Efficienza: sono in grado di generare la stessa quantità di energia dei pannelli fotovoltaici tradizionali.
- Sicurezza: sono realizzati con materiali durevoli e resistenti alle intemperie, quindi sono sicuri e affidabili.

Pompei “Smart Archeological Park”

LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica:
C

Temperature massime medie (°C):
40°C - 16°C

Venti prevalenti:
SSO

POSIZIONAMENTO	TESSUTO
PICCOLA CITTÁ	ARCHEOLOGICO

TIPOLOGIA DI INTERVENTO:
Efficientamento energetico di edifici adibiti a biglietteria

LOCALIZZAZIONE:
Pompei, Napoli, Campania

PROGETTISTI:
Ministero dei Beni Culturali e CNR

DESTINAZIONE:
Parco Archeologico

DATA IMPIANTO ORIGINALE:
IX sec. a.C.

ANNO INTERVENTO:
2018

DESCRIZIONE INTERVENTO:
Sperimentazione di coppi fotovoltaici, ossia, moduli speciali non convenzionali progettati e costruiti specificatamente per integrarsi e sostituire elementi architettonici degli edifici.

USO	PROMISCUITÀ
PUBBLICO	PARCO ARCHEOLOGICO
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

MORFOLOGIA

CARATTERISTICHE ENERGETICHE

Al fine di garantire una qualità sempre costante, ogni 1000 moduli prodotti viene testato un pezzo a campione. Per coprire 15 mq sono necessari 223 coppi fotovoltaici - potenza nominale iKW.

In. 27 COPPI FOTOVOLTAICI

PRINCIPIO DI FUNZIONAMENTO

La misura prevede lo smontaggio e la sostituzione dei coppi tradizionali esistenti con coppi fotovoltaici per la produzione di energia solare mantenendo inalterato l'aspetto estetico e la funzionalità della classica copertura in cotto.

APPLICABILITÀ

L'installazione asseconda i tipici cromatismi dell'architettura tradizionale, ma anche i vincoli costruttivi di centri e dimore storiche, dove è importante tutelare l'impatto visivo del panorama architettonico. Ogni coppo riproduce un particolare effetto antico, che si armonizza con le coperture preesistenti ed entra in sintonia con le peculiari caratteristiche dei borghi storici, rendendolo adatto per restauri e recuperi che rispettino il contesto in cui sono inseriti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

– non vengono modificate nè alterate le proprietà di volano termico tipiche del cotto e neppure quelle dei canali di deflusso;

- vincono il gelo, il peso della neve, la forza degli agenti atmosferici;

– la posa non necessita di vasche e/o staffe di fissaggio; vengono perciò scongiurati tutti i problemi legati ad infiltrazioni e ponti termici; l'installazione di un diodo di by-pass rende il sistema esente da problemi creati per ombreggiamenti mobili o inattesi (alberi, camini, antenne, foglie ecc.);

– il canale di ventilazione tra il modulo PV ed il coppo rende il sistema meno sensibile alle alte temperature estive (minor temperatura implica maggior rendimento);

– nel caso di diminuzione di potenza per un modulo guasto non è necessaria la sua sostituzione dato l'auto disinserimento.

Se si volesse comunque procedere al cambio, non viene richiesto l'uso di personale specializzato;

– non ultimo vantaggio di poter integrare il sistema in una copertura esistente, sostituendo solo i metri quadri interessati, senza dover ricorrere a ulteriori costose opere di impermeabilizzazione perimetrali.

Il coppo fotovoltaico in cotto brevettato è protetto dai diritti di privativa industriale.

Svantaggi:

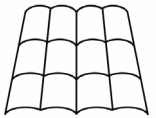
In genere il costo del coppo fotovoltaico, poichè favorisce maggiormente la qualità ambientale e anche perchè attualmente non molto diffuso in commercio, è molto alto, tuttavia si prevede nei prossimi anni una diffusione maggiore e un costo nettamente più vantaggioso rispetto a quello attuale.

SINERGIE E INTERAZIONI

Sono progettati per alloggiare un modulo fotovoltaico in silicio monocristallino, dotato di un canale di ventilazione continua evitando il surriscaldamento del modulo e della struttura sottostante. I canali di flusso dell'acqua rimangono invariati permettendo il corretto scorrimento delle acque piovane. Il sistema funziona meglio se perfettamente collegato al resto degli impianti dell'edificio e collegato ad altri fonti di energia rinnovabile, rispetto al suo funzionamento singolo.

NORMATIVA DI RIFERIMENTO

UNI CEI TS 11696:2017



DISPOSITIVI CAPTAZIONE E.S.

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

COTTO
PANNELLO FOTOVOLTAICO ROSSO

SOLUZIONE CONFORME

POSIZIONAMENTO NELL'INTERA COPERTURA

ESPOSIZIONE NELLA FALDA SUD

In. 28 CAMINI DI LUCE

PRINCIPIO DI FUNZIONAMENTO

La misura prevede la realizzazione di un camino di luce per trasportare l'illuminazione naturale nei locali interni o ipogei dell'edificio privi d'illuminazione diretta. Il sistema è composto da una testa di captazione, un condotto di captazione ed un'unità diffusore.
La testa di captazione posta in copertura che raccoglie la radiazione solare diretta e diffusa convogliandola nel condotto luminoso. Può essere fissa o mobile, costituita da lenti e apparecchiature che, grazie a un motore elettrico, segue il moto apparente del sole. Il cavedio di captazione (esistente o di nuove progettazione) di sezione ridotta, trasporta la luce naturale negli ambienti, sfruttando le caratteristiche di materiali riflettenti e speculari di cui è rivestito. Il fattore di rendimento luminoso (l'intensità luminosa trasferita) dipende dalla forma del condotto (rapporto tra aria di sezione e lunghezza e regolarità del condotto) e dal coefficiente di riflessione del rivestimento interno. I materiali utilizzati sono pellicole riflettenti in alluminio o argento, materiali a riflessione interna o gli Optic Light Film. L'unità diffusore reindirizza e diffonde la radiazione solare trasportata, regolando la luce in entrata nell'ambiente ed eliminando eventuali abbagliamenti.

APPLICABILITÀ

La misura è applicabile in presenza di locali interni o ipogei non raggiunti da illuminazione diretta, compatibilmente con i vincoli sulla copertura degli edifici di pregio o in presenza di coperture instabili o altammente degradate che vanno sostituite.

VANTAGGI / SVANTAGGI / RISCHI

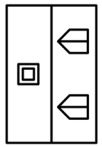
I vantaggi del sistema sono legati alla riduzione di consumi di energia elettrica per l'illuminazione artificiale e al soddisfacimento del benessere visivo da illuminazione naturale per gli utenti. Inoltre rende possibile sfruttare gli ambienti interni o ipogei privi d'illuminazione diretta. Tuttavia il dimensionamento, la progettazione e la realizzazione del sistema sono abbastanza complesse sul patrimonio edilizio esistente. I sistemi attivi o mobili consentono di massimizzare la radiazione solare captata, ma necessitano di energia elettrica, al contrario dei sistemi passivi o fissi.

SINERGIE E INTERAZIONI

È conveniente verificare l'assenza di ostruzioni che creano ombreggiamento sulle coperture e fare una simulazione del comportamento del camino di luce per verificarne l'efficienza. Il funzionamento è ottimizzato dalla presenza di pareti interne rivestite con colori chiari e riflettenti.

NORMATIVA DI RIFERIMENTO

UNI TS 11300-1:2008, D. lgs 311.2006



DISPOSITIVI CAPTAZIONE E.S.

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

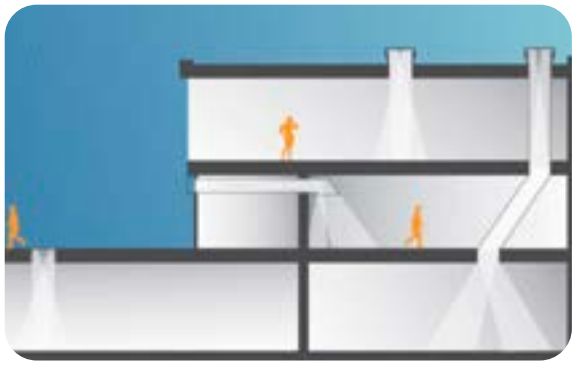
INCOLORE

SOLUZIONE CONFORME

POSIZIONAMENTO NELL'INTERA COPERTURA
ESPOSIZIONE NELLA FALDA SUD

DATI TECNICI

SUPERFICIE ILLUMINABILE
< 10 m^2
LUNGHEZZA MASSIMA SUGGERITA
< 8 m
FORO SOLAIO
Cartongesso 275 - 280 mm (max)
ISOLAMENTO ACUSTICO
UNI EN ISO 717-1.2013
TRASMITTANZA TERMICA
U = 1,3 W/m^2K



MODALITÀ DI POSA

Materiali necessari

- Kit di posa del solar tube
- Martello
- Scalpello
- Trapano
- Livella
- Nastro adesivo
- Silicone

Procedimento

Il primo passo è preparare il foro sul tetto, che deve avere le seguenti dimensioni:

- Diametro del foro: 300 mm
- Profondità del foro: 200 mm

Per realizzare il foro, è possibile utilizzare un trapano e una sega circolare. È importante utilizzare un disco diamantato per evitare di danneggiare il materiale del tetto.

Una volta realizzato il foro, è possibile installare il solar tube. Per farlo, è necessario seguire le istruzioni fornite nel kit di posa.

In generale, i passaggi da seguire sono i seguenti:

- Inserire il solar tube nel foro sul tetto.
- Fissare il solar tube al tetto utilizzando i tasselli e le viti forniti nel kit.
- Collegare il solar tube alla luce artificiale.
- Installazione del solar tube sul tetto
- Sigillatura del foro

L'ultimo passo è sigillare il foro sul tetto. Per farlo, è necessario applicare del silicone attorno al solar tube.

Suggerimenti

È importante scegliere il solar tube adatto al tipo di tetto.È consigliabile consultare un professionista prima di procedere con l'installazione.

Vantaggi del solar tube

- Aumenta la luminosità naturale degli ambienti.
- Migliora l'umore e la produttività delle persone.
- Riduce i consumi energetici.
- Aumenta il valore dell'immobile.

In. 29 CAMINI DI VENTILAZIONE

PRINCIPIO DI FUNZIONAMENTO

L'intervento consiste nell'attivazione di cavedi esistenti o vani di distribuzione, per innescare una ventilazione naturale dell'edificio del tipo "effetto camino". L'effetto camino sfrutta la differenza di temperatura dell'aria tra interno ed esterno per estrarre l'aria viziata dagli ambienti ed espellerla verso la vosta celeste. Si può ricorrere all'effetto camino fornendo l'edificio di aperture sia in basso che alla sua sommità: l'aria calda salirà naturalmente e uscirà dalle aperture in alto mentre l'aria fredda entrerà attraverso le aperture alla base. La ventilazione con effetto camino, non è molto altra e di norma non superano i 4-6 rinnovamenti orari dell'aria in un ambiente.

APPLICABILITÀ

I camini di ventilazione possono essere attivati in edifici che per conformazione sono dotati di cavedi con sezioni sufficientemente ampie, vani scala, atri, corti chiuse o ulteriori sistemi di connessione verticale. Molto edifici storici hanno impliciti dispositivi di ventilazione spesso in disuso, che possono essere rimessi in funzione dotandoli di controllo intelligente remoto.

VANTAGGI / SVANTAGGI / RISCHI

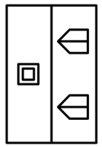
I sistemi di ventilazione naturale controllata permettono di regolare il comfort termo-igrometrico e ventilativo degli ambienti interni di un edificio. Inoltre sono molto utili per evitare stratificazioni d'aria calda nella parte alta degli ambienti interni e questo è importante soprattutto nel caso di spazi con una grande connessione verticale.
Per la prevenzione antincendi, i rischi derivano dal movimento d'aria ascensionale in vani tecnici che può generare l'accelerazione del processo di combustione in fase di innesco di un incendio nel vano i in locali confinanti e il trasporto di fumi ai locali superiori comunicanti con il vano. Questo procedimento si può ovviare installando chiusure esterne impermeabili superiori con modalità d'apertura comandata elettronicamente, in collegamento con sensori di apertura comandata elettronicamente, in collegamento con sensori di temperatura e rilevatori di fumo, per mantenere il vano soprappressione (apertura chiusa) durante l'incendio, per poi aprirlo per facilitare l'uscita del fumo, e installando porte resistenti al fuoco e a tenuta d'aria in tutti i locali comunicanti con il vano.

SINERGIE E INTERAZIONI

Per una buona estrazione dell'aria è utile che vi siano differenze piuttosto rilevanti tra l'aria calda nella parte più alta dell'edificio e l'aria esterna. Per aumentare queste differenze, si possono integrare sistemi che permettono di aumentare la temperatura nella parte più alta del camino, ad esempio il camino solare. Il funzionamento di questo sistema è basato sulla realizzazione di una camera d'aria sul tetto costituita da un captatore, di colore scuro, coperto da un vetro, l'aria che si trova nel camino solare, scaldandosi, diminuisce la sua densità e richiama aria nuova dalle aperture inferiori.

NORMATIVA DI RIFERIMENTO

UNI EN ISO 13790:2008, UNI 10339



DISPOSITIVI CAPTAZIONE E.S.

adeguamento superficiale

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI capta

COLORI COMPATIBILI

INCOLORE

SOLUZIONE CONFORME

POSIZIONAMENTO NELL'INTERA COPERTURA
ESPOSIZIONE NELLA FALDA SUD

La prima scuola con Protocollo LEED nel Sud Italia

LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica:
D

Temperature massime medie (°C):
21°C - 11°C

Venti prevalenti:
NO, NOX

POSIZIONAMENTO	TESSUTO
EXTRAURBANO	PERIFERICO

TIPOLOGIA DI INTERVENTO:
Realizzazione di una scuola ad alta efficienza energetica

LOCALIZZAZIONE:
Isnello, PA, Sicilia

PROGETTISTI:
AM3 Architetti

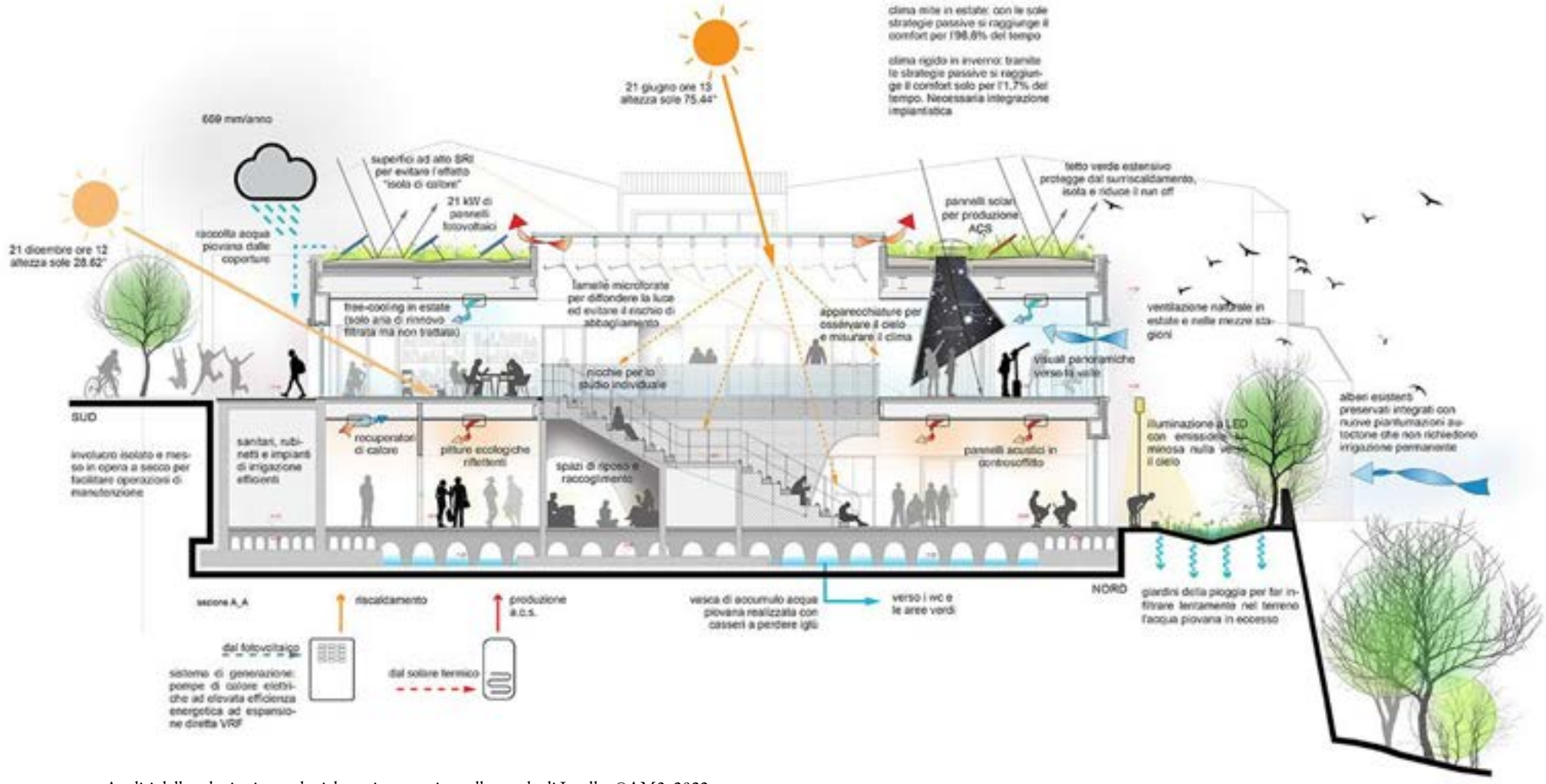
DESTINAZIONE:
Uso scolastico

ANNO INTERVENTO:
2020

COSTO INTERVENTO:
3 milioni e 650 mila euro

DESCRIZIONE INTERVENTO:
Edificio scolastico nZEB, a consumo di suolo zero, circolare e prima scuola LEED del Sud Italia.

USO	PROMISCUITÀ
PUBBLICO	ADDOSSATO
TIPOLOGIA ANTE	**TIPOLOGIA POST**
/	PUBBLICO
MORFOLOGIA	**CARATTERISTICHE ENERGETICHE**
/	Certificazione LEED; Progettazione sostenibile; Fonti rinnovabili; Efficienza idrica; Materiali eco-compatibili;



Analisi della soluzioni tecnologiche attive e passive nella scuola di Isnello; ©AM3, 2022

SCUOLA LEED

Il progetto della nuova scuola a Isnello sarà la prima scuola LEED del Sud Italia, un obiettivo raggiunto grazie alla sua progettazione partecipata e alla sua attenta considerazione delle esigenze della comunità locale. Il Comune ha avviato il percorso per la progettazione del nuovo Istituto Comprensivo Luigi Pirandello circa due anni fa. Questo progetto ha coinvolto attivamente la cittadinanza locale, permettendo di integrare i bisogni e le aspirazioni della comunità nel design della scuola. L'edificio si integra perfettamente con il contesto urbano e naturale circostante, nel cuore del Parco delle Madonie. Certificata LEED, sarà alimentata da un impianto fotovoltaico e solare termico per ridurre al minimo il consumo di energia esterna. La gestione delle acque piovane sarà ottimizzata con sistemi di raccolta e riutilizzo, mentre la costruzione stessa sarà gestita per limitare l'impatto ambientale durante il cantiere. All'interno spazi modulari consentiranno una flessibilità nell'uso delle aule, adattandosi alle diverse esigenze didattiche e ricreative. Ci sarà anche uno spazio dedicato alla riflessione e al raccoglimento, oltre a un auditorium per eventi culturali e assemblee. La struttura sarà completamente accessibile e sarà dotata di percorsi e indicazioni apposite per non vedenti e ipovedenti. Particolare attenzione sarà dedicata all'ottimizzazione dell'illuminazione naturale e artificiale, per garantire un ambiente confortevole e sostenibile.

Committente: Comune di Isnello
Direzione Lavori: AM3 Alberto Cusumano
General Contractor: Arceri Costruzioni Vincenzo Arceri
LEED AP Project Administrator: SUMs Architects Giulia Pentella
LEED AP General Contractor: Carola Arrivas Bajardi
Commissioning Authority: Gian Paolo Perini

Linee Guida

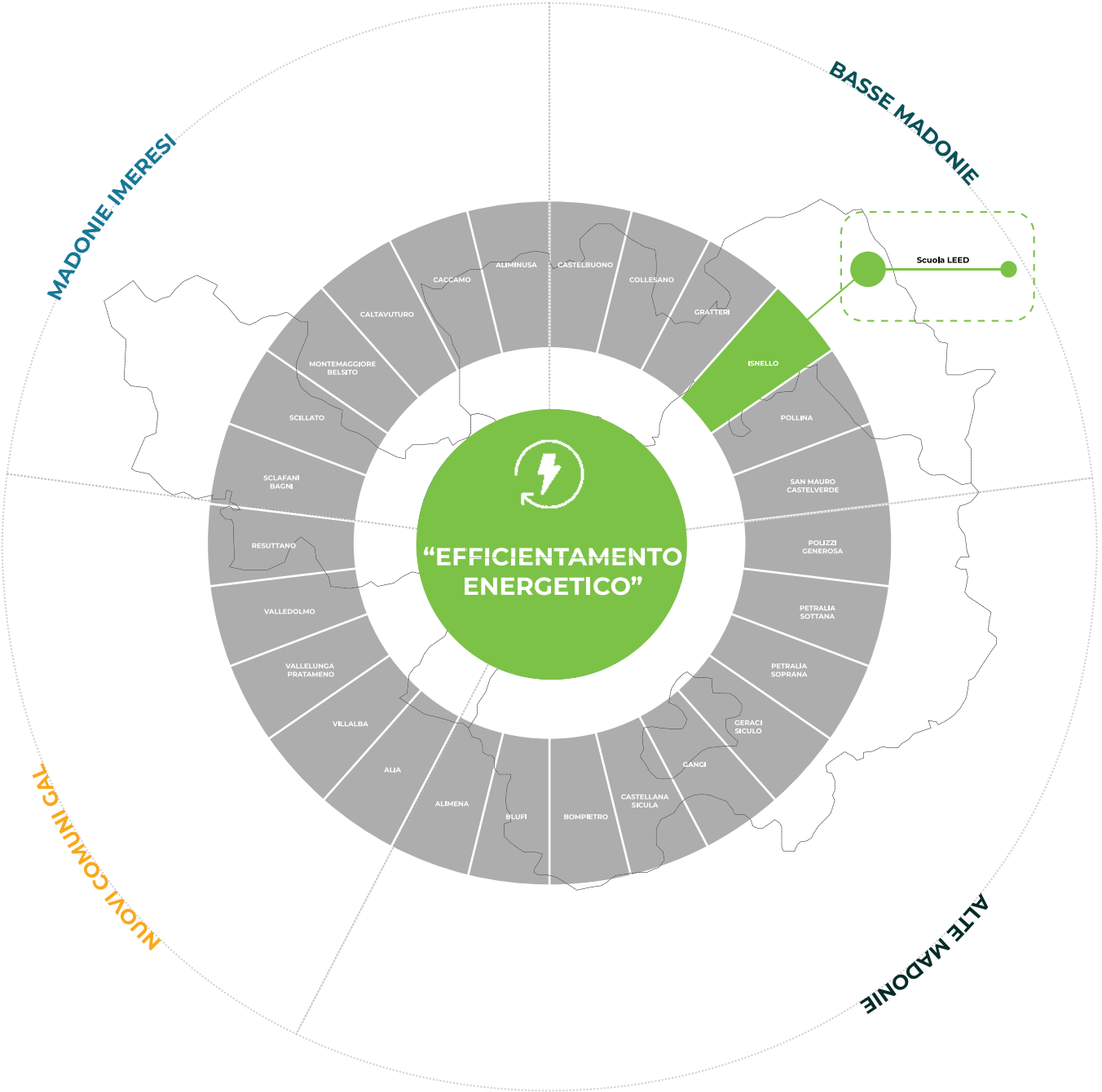
- **ascolto attivo e consultazione:** Organizzare incontri pubblici e sessioni di ascolto con i residenti locali e i rappresentanti dei comuni vicini per comprendere le loro esigenze, preoccupazioni e suggerimenti relativi al progetto. L'ascolto delle voci della comunità è fondamentale per costruire un consenso e per garantire che il progetto risponda effettivamente ai bisogni locali.
- **trasparenza e comunicazione:** Mantenere la trasparenza riguardo alle decisioni prese e ai processi coinvolti nella progettazione e costruzione della scuola. Utilizzare canali di comunicazione aperti e accessibili per informare regolarmente la comunità sui progressi del progetto, rispondendo alle domande e alle preoccupazioni sollevate.
- **partecipazione attiva:** Offrire opportunità concrete di partecipazione attiva attraverso gruppi di lavoro, comitati consultivi o focus group che coinvolgano i residenti locali, le associazioni culturali, gli imprenditori e altri stakeholder locali. Questo tipo di partecipazione può contribuire a generare idee innovative e a migliorare la qualità complessiva del progetto.
- **educazione e sensibilizzazione:** Organizzare sessioni educative e workshop per informare la comunità sui benefici della sostenibilità ambientale e sui principi dell'edilizia verde. Questo può aumentare l'entusiasmo e l'appoggio per il progetto, incoraggiando una cultura di responsabilità ambientale e sociale.
- **incorporazione della cultura locale:** Valorizzare e integrare elementi della cultura locale e della storia nel design e nelle funzionalità della scuola. Ad esempio, utilizzare materiali e artigianato locali nel processo di costruzione, o creare spazi per esposizioni culturali e attività tradizionali che celebrano l'identità locale.
- **creazione di opportunità economiche:** Esplorare partnership con piccole imprese locali per fornire materiali o servizi per la costruzione della scuola. Questo non solo sostiene l'economia locale, ma crea anche un senso di proprietà e di beneficio tangibile nella comunità.
- **sostenibilità a lungo termine:** Implementare misure per l'utilizzo sostenibile dell'edificio dopo la sua costruzione, come programmi educativi sulla sostenibilità per gli studenti e la comunità, o l'integrazione di pratiche di manutenzione eco-friendly per garantire che l'edificio continui a servire come esempio di buone pratiche ambientali nel tempo.
- **monitoraggio e feedback continuo:** Istallare meccanismi di monitoraggio per valutare l'impatto del progetto sulla comunità e sull'ambiente nel tempo. Raccogliere feedback costanti e apportare eventuali miglioramenti necessari per adattarsi alle esigenze emergenti e migliorare le operazioni.

Benefici del principio di inclusività

L'inclusività in un progetto come la costruzione di una scuola sostenibile a Isnello non è solo una pratica buona, ma un fondamento essenziale per il suo successo e impatto positivo sulla comunità locale. Coinvolgere attivamente i residenti e i comuni circostanti non solo aumenta la legittimità del progetto, ma porta anche benefici significativi sotto diversi aspetti. In primo luogo, l'inclusività promuove una migliore qualità del progetto stesso. Le diverse prospettive e esperienze portate dalla comunità possono rivelare sfumature importanti che migliorano il design e l'implementazione dell'edificio. Il coinvolgimento delle persone locali può identificare problemi potenziali in anticipo e suggerire modifiche che rendono il progetto più efficace e adattabile

alle esigenze reali della zona.
Inoltre, un approccio inclusivo supporta la sostenibilità a lungo termine. Una comunità ben informata e coinvolta è più propensa a sostenere e ad adottare pratiche sostenibili nel tempo. Questo può comprendere comportamenti eco-friendly come la gestione consapevole dei rifiuti o l'uso responsabile delle risorse naturali, che sono in linea con l'intento ambientale della scuola.
L'inclusività crea anche opportunità economiche locali. Collaborazioni e subappalti con imprese del luogo possono stimolare l'economia locale, offrendo benefici economici diretti attraverso il lavoro e indiretti attraverso l'attrattività della zona per residenti e visitatori.
Dal punto di vista sociale, un progetto inclusivo rafforza il senso di comunità e la coesione sociale. La collaborazione tra residenti, associazioni locali e autorità pubbliche favorisce un ambiente di fiducia reciproca e supporto, migliorando il benessere generale e la qualità della vita nella zona.
Educazione e consapevolezza sono ulteriori benefici. Coinvolgere la comunità nel progetto aumenta la consapevolezza sulla sostenibilità ambientale e sugli impatti delle scelte quotidiane. Programmi educativi e iniziative della scuola possono diffondere conoscenze che influenzano positivamente le generazioni future, promuovendo comportamenti sostenibili e responsabili.

COMUNI CONVOLTI	
ALTE MADONIE	0/9
BASSE MADONIE	1/6
MADONIE IMERESI	0/6
	1/21
COLLABORAZIONE	1/26
% COMUNI COINVOLTI	**3,84%**



Geraci Siculo; ©Luisa Lombardo, 2023

Nonostante le criticità, i vantaggi a lungo termine dell'efficienza energetica negli edifici superano di gran lunga i costi e le difficoltà iniziali. Con l'evoluzione continua delle tecnologie e la crescente consapevolezza, i criteri di efficienza energetica assumeranno un ruolo sempre più rilevante nella progettazione e costruzione di edifici.

FATTORI TRAINANTI

Riduzione dei costi energetici: Gli edifici ad alta efficienza energetica consumano meno energia, il che si traduce in bollette più basse per i proprietari o gli inquilini. Questo può essere un fattore importante, soprattutto nelle aree con costi energetici elevati.

Maggiore comfort: Gli edifici ad alta efficienza energetica sono generalmente più confortevoli da vivere, in quanto hanno una temperatura interna più stabile e una migliore qualità dell'aria. Questo è dovuto a fattori come un migliore isolamento e sistemi di riscaldamento e raffreddamento più efficienti.

Riduzione dell'impatto ambientale: Gli edifici ad alta efficienza energetica consumano meno energia, il che significa che producono meno emissioni di gas serra. Questo aiuta a mitigare i cambiamenti climatici e a proteggere l'ambiente.

Aumento del valore immobiliare: Gli edifici ad alta efficienza energetica tendono ad avere un valore di mercato più alto rispetto agli edifici meno efficienti. Questo perché gli acquirenti sono disposti a pagare di più per edifici che offrono risparmi energetici e un maggiore comfort.

Maggiore sicurezza energetica: Gli edifici ad alta efficienza energetica sono meno dipendenti dai combustibili fossili, il che li rende più sicuri in caso di interruzioni dell'approvvigionamento energetico o di fluttuazioni dei prezzi.

Creazione di posti di lavoro: L'industria dell'efficienza energetica degli edifici è in rapida crescita e sta creando nuovi posti di lavoro in settori come l'edilizia, la produzione e la tecnologia.

PUNTI CRITICI

Costi iniziali più elevati: Gli edifici ad alta efficienza energetica possono avere costi iniziali più elevati rispetto agli edifici tradizionali. Questo è dovuto al fatto che richiedono materiali e tecnologie più costosi. Tuttavia, questi costi iniziali sono spesso compensati dai risparmi energetici nel corso della vita dell'edificio.

Complessità tecnica: La progettazione e la costruzione di edifici ad alta efficienza energetica possono essere più complesse rispetto agli edifici tradizionali. Questo richiede ingegneri e costruttori con competenze specialistiche.

Mancanza di consapevolezza: Non tutti sono a conoscenza dei benefici degli edifici ad alta efficienza energetica o di come realizzarli. Questo può ostacolare l'adozione di questi criteri.

Barriere normative: In alcuni casi, le normative edilizie o gli standard di finanziamento possono ostacolare l'adozione di criteri di efficienza energetica più rigorosi.

Mancanza di incentivi: In alcuni casi, non ci sono incentivi sufficienti per incoraggiare i proprietari o gli sviluppatori a costruire edifici ad alta efficienza energetica.

Regia Trazzera a Caltavuturo; ©Luisa Lombardo, 2022

Le soluzioni tecnologiche proposte fino ad oggi rappresentano solo una parte delle numerose strategie che possono essere applicate nel settore edilizio. Esse emergono come gli interventi principali, in quanto capaci di assicurare il recupero degli edifici esistenti, garantendo al contempo la compatibilità tecnica e tecnologica, oltre a introdurre elementi di innovazione. Tuttavia, l'universo delle possibili soluzioni è estremamente vasto e in costante evoluzione, e per questo motivo è fondamentale comprendere che le opzioni suggerite non sono le uniche disponibili, ma solo quelle più comunemente adottate per raggiungere obiettivi di riqualificazione ed efficienza.

In questo contesto, è sempre opportuno rivolgersi a un tecnico qualificato, il quale può analizzare le specificità di ciascun progetto e suggerire le soluzioni più adatte in funzione delle caratteristiche dell'edificio e delle normative locali. Ogni edificio, infatti, ha peculiarità che richiedono una valutazione dettagliata per scegliere la tecnologia più appropriata, sia sotto il profilo della fattibilità tecnica, sia sotto quello dell'integrazione con il contesto ambientale e paesaggistico. Un tecnico esperto può inoltre fornire consulenza su come le varie soluzioni interagiscono con le esigenze pratiche dell'utente, garantendo così un'implementazione sicura ed efficiente.

Parallelamente alla necessità di consulenza tecnica, la selezione delle tecnologie ha anche lo scopo di rendere il fruitore più consapevole riguardo all'utilizzo, ai vantaggi e agli svantaggi di ciascuna opzione. In questo modo, l'utente può sviluppare una visione più "smart" e consapevole delle opportunità di integrazione tecnologica nel proprio edificio, comprendendo appieno le implicazioni delle scelte effettuate. Questa consapevolezza permette di considerare non solo il risparmio energetico e l'efficienza, ma anche aspetti come la manutenzione a lungo termine, i costi iniziali, la sostenibilità ambientale e l'impatto estetico.

Uno degli aspetti più importanti da tenere presente è che non tutte le soluzioni disponibili sul mercato, o in fase sperimentale, possono essere applicate in ogni contesto. In particolare, quando ci si trova in aree soggette a vincoli paesaggistici o architettonici, è necessario rispettare le normative che regolano l'intervento sul patrimonio edilizio esistente. Questo può significare che alcune tecnologie, per quanto innovative, non siano compatibili con l'ambiente o le strutture storiche che caratterizzano il contesto. Di conseguenza, una valutazione accurata del contesto in cui si opera è cruciale per assicurare che l'intervento non solo sia efficace, ma anche rispettoso delle caratteristiche storiche e paesaggistiche del territorio.

La varietà di soluzioni tecnologiche applicabili agli edifici è vastissima, ma per orientarsi in modo corretto è indispensabile un approccio informato e consapevole. Grazie all'assistenza di esperti del settore, e tenendo conto delle caratteristiche del contesto e dei vincoli presenti, è possibile integrare tecnologie che favoriscano l'innovazione e il recupero senza compromettere il rispetto per l'ambiente e l'integrità delle strutture architettoniche. Questa sinergia tra consapevolezza del fruitore e competenza tecnica rappresenta la chiave per un'adozione responsabile e sostenibile delle soluzioni tecnologiche più all'avanguardia.

VALUTAZIONE DELLA VULNERABILITÀ SISMICA DEL PATRIMONIO COSTRUITO E PROPOSTE DI INTERVENTO

Isnello; ©Quelli del Parco delle Madonie, 2023

La scelta degli interventi deve essere guidata dal comportamento strutturale dell'edificio e dalla valutazione della sicurezza, evitando modifiche invasive e incongrue che potrebbero compromettere l'integrità strutturale.

Come indicato nelle "Linee guida per la valutazione e la riduzione del rischio sismico del patrimonio culturale" (Decreto del Ministero delle Infrastrutture e dei Trasporti del 14 gennaio 2008) e nel Decreto del Ministero delle Infrastrutture e dei Trasporti del 17 gennaio 2018 "Aggiornamento delle Norme Tecniche per le costruzioni", gli interventi devono riguardare singole parti del manufatto e devono essere contenuti per estensione e numero, evitando alterazioni significative della distribuzione originale delle rigidezze negli elementi strutturali.

Gli interventi su porzioni limitate dell'edificio devono essere valutati e giustificati nel contesto di una visione d'insieme.

La scelta delle tecniche d'intervento, che deve essere effettuata caso per caso, dovrebbe privilegiare quelle meno invasive e più compatibili con l'esistente, considerando al contempo i requisiti di sicurezza e durabilità.

Le costruzioni tradizionali in muratura portante, come quelle presenti nel Parco delle Madonie, tipicamente presentano sistemi strutturali basati su pareti verticali e orizzontamenti (solai in legno o volte). Il comportamento complessivo di tali costruzioni in presenza di azioni sismiche dipende dal tipo e dalle dimensioni delle murature, dai collegamenti tra le pareti ortogonali e da quelli tra le pareti e gli orizzontamenti.

Ogni intervento strutturale, anche se parziale, deve essere considerato in funzione della potenziale attivazione di meccanismi locali e del comportamento complessivo dell'edificio. Gli interventi devono essere progettati e valutati da esperti in consolidamento strutturale e devono mirare principalmente a:

- **assicurare un adeguato ammorsamento tra le pareti portanti e migliorare i collegamenti tra murature e solai.** È consigliabile valutare l'inserimento di tiranti, preferibilmente in acciaio e ancorati alle pareti con bolzoni esterni, non inglobati nella muratura. Potrebbe essere necessaria la consolidazione localizzata delle murature in corrispondenza degli ancoraggi dei tiranti. Quando gli ammorsamenti sono deteriorati o insufficienti, la tecnica dello "scuci e cuci" può essere utilizzata per migliorare i collegamenti, utilizzando elementi della stessa natura della muratura esistente. Nei sistemi di orizzontamento voltati, è essenziale verificare che le spinte siano adeguatamente contrastate.
- **eseguire interventi di irrigidimento limitato dei solai**, preferendo la conservazione dei solai lignei per il loro modesto peso. Per l'irrigidimento dei solai in legno, è prassi comune realizzare un nuovo tavolato in legno posato in direzione ortogonale o obliqua rispetto al tavolato esistente, collegandolo adeguatamente alla muratura. Ulteriori consolidamenti possono includere controventamenti con tiranti metallici o rinforzi con bandelle metalliche fissate al tavolato esistente. Per limitare le deformazioni dovute a sollecitazioni di flessione, è possibile utilizzare un secondo tavolato ortogonale costituito da tavole continue, connesse alle travi in legno portanti.
- **intervenire sulle coperture e sui collegamenti tra queste e le murature portanti.** È preferibile mantenere la struttura di copertura in legno, eventualmente inserendo cordoli alla sommità delle murature per migliorare la connessione e distribuire i carichi della copertura. È consigliabile realizzare i cordoli in legno, acciaio o muratura armata, evitando il calcestruzzo armato che risulta scarsamente compatibile con le murature tradizionali. Nelle strutture a capriata, è necessario verificare e, se necessario, rinforzare i nodi con elementi metallici. È inoltre possibile inserire catene metalliche come controventi all'intradosso delle falde o irrigidire i tavolati esistenti con sovrapposizione incrociata di nuovi tavolati.
- **realizzare interventi di adeguamento impiantistico**, evitando operazioni che possano ridurre la capacità resistente degli elementi strutturali, compromettere l'efficacia dei collegamenti tra elementi o indebolire le unioni d'angolo tra murature ortogonali.

È opportuno notare che le esperienze dei terremoti hanno dimostrato che l'uso di cordoli, coperture e solai in cemento armato è sconsigliabile a causa dell'elevata massa che incrementa le azioni sismiche e della rigidezza eccessiva di questi elementi, che possono compromettere la muratura sottostante.

Infine, nella realizzazione di cordoli sommitali in muratura armata, è fondamentale utilizzare acciaio inossidabile per le parti metalliche incorporate nella muratura (barre di armatura, piattine, connessioni), per evitare problemi di ossidazione e

conseguente disgregazione. L'uso di acciaio normale, soggetto a rigonfiamento per ossidazione, può causare fessurazioni e significative disgregazioni del cordolo. La complessità del ripristino giustifica ampiamente i costi aggiuntivi per l'utilizzo di acciaio inossidabile.

Normativa di Riferimento

I principali riferimenti normativi in materia includono:

- Decreto del Ministero delle Infrastrutture e dei Trasporti del 17 gennaio 2018, "Aggiornamento delle Norme Tecniche per le Costruzioni";
- Direttiva del Presidente del Consiglio dei Ministri del 9 febbraio 2011, "Valutazione e Riduzione del Rischio Sismico del Patrimonio Culturale con Riferimento alle Norme Tecniche per le Costruzioni di cui al Decreto Ministeriale 14 gennaio 2008";
- Deliberazione della Giunta Regionale del Piemonte n. 11-13058 del 19 gennaio 2010, entrata in vigore con D.G.R. n. 4-3084 del 12 dicembre 2011, "Approvazione delle Procedure di Controllo e Gestione delle Attività Urbanistico-Edilizie ai Fini della Prevenzione del Rischio Sismico Attuativa della Nuova Classificazione Sismica del Territorio Piemontese".

San Mauro Castelverde; ©Quelli del Parco delle Madonie, 2023

8.1 – LA DIAGNOSI DELLA VULNERABILITÀ SISMICA DEGLI EDIFICI STORICI

Gli eventi sismici ricorrenti che interessano il nostro paese hanno reso sempre più urgente l'esigenza di approfondire la nostra comprensione della sismicità e del rischio sismico nel territorio in cui viviamo.

Analogamente alla definizione generale di rischio, il rischio sismico si determina attraverso la probabilità che un terremoto specifico si verifichi entro un dato intervallo di tempo (nota come pericolosità), moltiplicata per il danno potenziale in termini economici e di vite umane perse (definito come esposizione), con particolare attenzione alle aree più vulnerabili della società (identificate come vulnerabilità).

La regione Sicilia presenta una pericolosità sismica molto elevata, dovuta alla frequenza e all'intensità dei terremoti verificatisi nel corso della storia. Inoltre, la regione manifesta una vulnerabilità estremamente alta, attribuibile alla fragilità delle costruzioni, delle infrastrutture, delle attività industriali e produttive, nonché dei servizi. L'esposizione al rischio sismico è ulteriormente elevata, considerando la densità della popolazione e la presenza di un significativo patrimonio storico, artistico e monumentale situato in zone attraversate da faglie, molte delle quali sono ancora attive.

Seppur non sia possibile prevedere con precisione l'intensità di un terremoto, è invece possibile determinare la resistenza di un edificio in circostanze critiche. La vulnerabilità sismica misura la capacità di un edificio di resistere alle sollecitazioni causate da un terremoto. Più specificamente, rappresenta un valore numerico che sintetizza le caratteristiche di resistenza e di comportamento strutturale dell'abitazione durante un evento sismico.

Tale valutazione si basa sulle linee guida stabilite dalle Norme Tecniche per le Costruzioni, con particolare riferimento agli edifici preesistenti. Queste linee guida considerano i seguenti aspetti:

- **analisi storico-critica dell'edificio:** Raccolta di documentazione necessaria per comprendere il quadro preliminare generale, inclusi geometria dell'edificio, caratteristiche dei materiali e particolarità costruttive.
- **ispezione della struttura:** Raccolta di informazioni dettagliate per la creazione del modello di calcolo dell'edificio, in conformità alle Norme Tecniche per le Costruzioni (NTC), al fine di generare un modello strutturale accurato.
- **caratterizzazione meccanica dei materiali:** Valutazione del livello di resistenza della struttura esistente e acquisizione di informazioni sulla caratterizzazione sismica del sottosuolo, incluse le velocità di propagazione delle onde sismiche.
- **determinazione dei livelli di conoscenza:** I livelli previsti dalle NTC sono tre: LC1, LC2 e LC3, con LC3 rappresentante il massimo livello di conoscenza.
- **analisi strutturale:** Identificazione degli strumenti e delle tecniche per comprendere la meccanica della struttura e le eventuali azioni di adeguamento, comprendendo la distribuzione delle forze interne (tensioni, deformazioni, spostamenti, ecc.).
- **determinazione delle vulnerabilità:** Utilizzo di indicatori di rischio per migliorare o adeguare l'edificio.
- **proposta di interventi:** Suggerimento di interventi necessari per garantire l'adeguamento dell'edificio al rischio sismico presente nella zona, sulla base delle fasi precedenti dell'analisi di vulnerabilità, con attenzione ai costi e benefici degli interventi proposti.

L'analisi di vulnerabilità sismica fornisce una panoramica dettagliata dello stato dell'edificio e guida nella pianificazione degli interventi necessari per migliorare la resistenza sismica, contribuendo a una maggiore sicurezza e protezione contro i rischi sismici.

Caltavuturo ©Luisa Lombardo, 2023

8.2 – PROCEDURE PER MIGLIORARE LA VULNERABILITÀ SISMICA DEGLI EDIFICI

Data l'importanza della sicurezza strutturale in zone sismiche, è essenziale comprendere e attuare strategie efficaci per mitigare i danni causati dai terremoti.

- **valutazione e analisi strutturale:** la valutazione e l'analisi strutturale costituiscono il punto di partenza per comprendere la capacità di una struttura di resistere ai terremoti. Questo processo implica un'analisi approfondita della resistenza dei materiali, della geometria strutturale e della distribuzione dei carichi.

- **retrofit strutturale:** il retrofit strutturale è una pratica comune per migliorare la resistenza sismica delle strutture esistenti. Questa operazione può comprendere l'aggiunta di componenti strutturali, come travi e colonne rinforzate, per aumentare la capacità di sopportare le forze sismiche.

- **isolamento sismico:** l'isolamento sismico è una tecnica avanzata volta a separare la struttura dall'azione sismica, riducendo così l'impatto dei terremoti. Tale separazione è spesso ottenuta tramite l'installazione di ammortizzatori sismici o isolatori situati sotto la struttura.

- **irrigidimento strutturale:** l'irrigidimento strutturale si concentra sull'aumento della resistenza e della rigidità della struttura per migliorare la sua capacità di resistere ai terremoti. Questa procedura può includere l'aggiunta di rinforzi, come tiranti o strutture ausiliarie.

- **sistema di riduzione del peso:** ridurre il peso della struttura può contribuire a diminuire le forze sismiche che agiscono su di essa. Questo obiettivo può essere raggiunto rimuovendo parti non essenziali della struttura o utilizzando materiali più leggeri durante il retrofit.

- **pianificazione e progettazione sismica:** una progettazione sismica adeguata è fondamentale per garantire che le strutture siano costruite secondo gli standard appropriati per affrontare le minacce sismiche locali. Ciò include la progettazione di fondamenta appropriate e la considerazione delle caratteristiche geologiche del sito.

- **educazione e consapevolezza:** l'educazione e la consapevolezza sono cruciali per ridurre il rischio di danni personali durante i terremoti. Informare i residenti e gli utenti delle strutture sulle procedure di sicurezza sismica può migliorare la loro capacità di risposta durante un evento sismico.

- **ricerca e innovazione:** la ricerca continua e l'innovazione sono essenziali per sviluppare nuove tecnologie e metodologie per migliorare la resilienza sismica delle strutture. Investire in nuove soluzioni può portare a progressi significativi nel campo della sicurezza strutturale.

Scillato; ©Luisa Lombardo, 2023

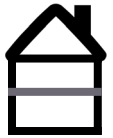
Montemaggiore Belsito; ©Quelli del Parco delle Madonie, 2023

3.1 – INDICE DELLE SOLUZIONI INDIVIDUATE

In. 01 - Irrigidimento solaio in legno mediante connettori e soletta in cls
In. 02 - Recupero di solai lignei con rinforzo intradossale ed estradossale
In. 03 - Rinforzo solai in legno mediante pannelli in xlam
In. 04 - Interventi con catene e tiranti per incrementare la rigidezza flessionale e nel piano
In. 05 - Utilizzo di cordoli su solai per incrementare la rigidezza flessionale e nel piano
In. 06 - Utilizzo di intonaco armato
In. 07 - Cucitura della muratura
In. 08 - Cuci – Scuci
In. 09 - Applicazione del metodo mochi
In. 10 - Realizzazione di barriere fisiche di risalita
In. 11 - Realizzazione di barriere chimiche alla risalita capillare
In. 12 - Realizzazione di sistemi elettrochimici di evacuazione dell'umidità
In. 13 - Sistemi di evacuazione dell'umidità con intonaci deumidificanti
In. 14 - Sistemi di evacuazione dell'umidità con vespaio areato
In. 15 - Miglioramento delle caratteristiche meccaniche del terreno con iniezioni
In. 16 - Opere di sostegno per impedire il rifluimento laterale del terreno
In. 17 - Modifica della distribuzione dei carichi della struttura
In. 18 - Sottofondazione con martinetti idraulici a perdere
In. 19 - Allargamento della base della fondazione
In. 20 - Fondazioni su pali di grosso e medio diametro
In. 21 - Fondazioni su pali di piccolo diametro (micropali)
In. 22 - Perforazioni armate
In. 23 - Realizzazione di nuove pareti
In. 24 - Telai metallici controventati
In. 25 - Cerchiature nelle aperture di murature portanti
In. 26 - Rinforzi con FRP
In. 27 - Ristilatura dei giunti
In. 28 - Rinforzi con architravi
In. 29 - Consolidamento di strutture orizzontali
In. 30 - Aggregazione di due edifici contigui

LEGENDA ICONE

Adeguamento sismico



Intervento di rinforzo strutturale dei solai

Intervento di ridistribuzione dei carichi

Intervento per migliorare il comportamento scatolare degli edifici

Realizzazione di nuove pareti

Intervento per un'equa distribuzione dei carichi e di cucitura delle murature

Inserimento di controventatura

Intervento nelle murature portanti

Cerchiature

Intervento in fondazione

Intervento per l'unione di due o più edifici

Alcune schede tecniche sono corredate di un alert, che segnala la compatibilità dell'intervento con il contesto:
Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.
Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

In. 01 IRRIGIDIMENTO SOLAIO IN LEGNO MEDIANTE CONNETTORI E SOLETTA IN CLS

PRINCIPIO DI FUNZIONAMENTO

Il solaio deve essere ben ammorsato alle murature in modo da contrastare gli spostamenti fuori-piano delle pareti (effetto tirante) e trasferire alle pareti di controvento le azioni derivanti dall'accelerazione della massa del solaio e delle pareti perpendicolari alla direzione del sisma (effetto trasferimento). Il rinforzo dei solai lignei esistenti negli edifici tradizionali in muratura rappresenta, dal punto di vista del progetto di recupero della struttura, una delle criticità più frequenti con cui i progettisti si devono interfacciare.

APPLICABILITÀ

I solai in legno esistenti esigono spesso interventi di rinforzo ed irrigidimento in quanto realizzati per sopportare carichi modesti; presentano quasi sempre deformabilità eccessiva rispetto alle attuali esigenze. La tecnica che permette di ottenere l'incremento della rigidezza, l'aumento della resistenza e quindi una maggiore capacità portante

VANTAGGI / SVANTAGGI / RISCHI

La struttura mista legno-calcestruzzo risulterà migliore rispetto alla struttura di solo legno in quanto più rigida e resistente ne risulterà migliorato anche il comportamento dinamico (vibrazioni) e l'isolamento acustico.
La soletta di calcestruzzo rappresenta un ottimo accorgimento tecnico negli edifici di muratura in zona sismica, in quanto consente di collegare fra di loro i muri portanti realizzando un piano rigido in grado di meglio ripartire le azioni sismiche orizzontali.
La tecnica del solaio collaborante conferisce al solaio due caratteristiche:
1) la rigidezza di piano, ovvero il comportamento rigido del solaio e la sua limitata deformabilità;
2) la continuità strutturale, ovvero il collegamento con le strutture verticali.
La presenza di entrambi questi fattori permette all'edificio di avere una qualità importante ai fini antisismici: il cosiddetto comportamento scatolare.
Il vantaggio di tale sistema si traduce in un incremento della capacità portante, nella realizzazione di un piano rigido (che soddisfa uno dei requisiti del buon comportamento sismico) e nella possibilità di realizzare efficaci collegamenti perimetrali.

SINERGIE E INTERAZIONI

È possibile sovrapporre alla struttura esistente una sottile soletta di calcestruzzo, adeguatamente armata e connessa, ottenendo per i vecchi solai un cospicuo aumento di resistenza, rigidezza e permettendo sezioni decisamente più modeste alle travi dei nuovi solai.
Il connettore si utilizza anche per il recupero e la realizzazione di coperture. L'interposizione dei connettori a piolo e ramponi tra le travi di legno e la soletta di calcestruzzo è necessaria per consentire ai due materiali di collaborare tra loro; il risultato sarà una struttura solidale dove, per effetto dei carichi verticali, il calcestruzzo risulterà prevalentemente compresso ed il legno prevalentemente teso.

NORMATIVA DI RIFERIMENTO

NTC 2018

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME

In. 02 RECUPERO DI SOLAI LIGNEI CON RINFORZO INTRADOSSALE ED ESTRADOSSALE

PRINCIPIO DI FUNZIONAMENTO

Gli interventi di consolidamento ed adeguamento ai carichi verticali dei solai di tipo ligneo vengono eseguiti mediante affiancamento di profili metallici alle travi principali, con realizzazione di soletta collaborante per quanto attiene i travetti, soluzione progettuale che risultava compatibile con le premesse architettoniche e logistiche di cui si è detto.

APPLICABILITÀ

Per quanto riguarda il rinforzo in accoppiamento tra le travi principali lignee e i nuovi profili in acciaio, la scelta progettuale è stata quella di affidare tutti i carichi permanenti e variabili ai soli profili in acciaio; tale ipotesi progettuale oltre ad essere la più cautelativa, parte dal presupposto che in fase di cantiere, ove vengano rimossi tutti i pavimenti e sostituite le tavelle, la trave in legno viene scaricata ed una volta accoppiata con gli elementi in acciaio, per ovvie questioni di diverso modulo di elasticità (circa un ordine di grandezza), le travi in acciaio saranno quelle che ricevono quasi tutto il carico.

VANTAGGI / SVANTAGGI / RISCHI

Una particolare attenzione esecutiva deve essere posta a far sì che i travetti trovino effettivo appoggio sui profili metallici recuperando la differenza di quota derivante dalle deformazioni permanenti che usualmente presentano le travi in legno; in questi casi occorre provvedere con l'inserimento di adeguati spessori in legno avvitati ai travetti a compensare tali differenze di quota.
Occorre prestare attenzione al dettaglio di appoggio delle nuove travi metalliche al fine di garantire la tenuta dello stesso, in virtù delle concentrazioni di sforzi locali che vanno applicati alla muratura.

SINERGIE E INTERAZIONI

Per quanto attiene il consolidamento dei travetti, questo è stato previsto con la tecnica dell'inserimento di connettori a secco. In questo caso specifico, data la presenza di travetti di dimensione anche molto ristretta si è ritenuto necessario operare una preliminare sostituzione di alcuni di essi al fine di avere larghezze adeguate all'esecuzione delle connessioni senza correre il rischio di indurre fessurazioni longitudinali all'elemento ligneo.
Le usuali prescrizioni progettuali che debbono essere indicate sugli elaborati progettuali derivano dal calcolo statico che definirà compiutamente il numero dei connettori e devono comprendere:

- Tipo connettore;
- Passo connettori;
- Prescrizioni eventuali sullo sfalsamento planimetrico degli stessi per evitare la creazione di fessurazioni longitudinali e la necessità o meno di eseguire pre-fori nella travi nel caso di connettori avvitati;
- Prescrizioni per l'eventuale puntellazione provvisoria dei travetti nella fase di presa del calcestruzzo.

Si pone in opera una barra di irrigidimento su ciascun lato della trave, fissata al legno e ulteriormente serrata da due cerchiature. Elementi costituiti da piattine in ferro battuto semplicemente inchiodati alla trave.

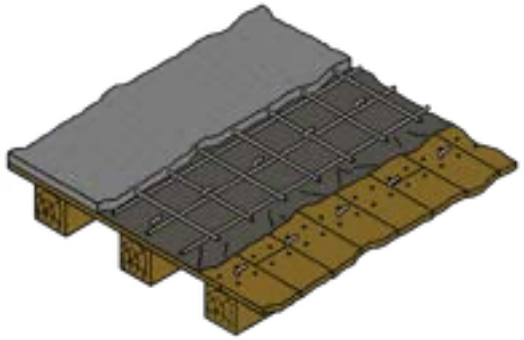
NORMATIVA DI RIFERIMENTO

NTC 2018

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 03 RINFORZO SOLAI IN LEGNO MEDIANTE PANNELLI IN XLAM

PRINCIPIO DI FUNZIONAMENTO

I pannelli a strati incrociati (XLam o CLT) vengono utilizzati per costruire pareti e solai in edifici nuovi con struttura portante in legno, ma si stanno rivelando efficaci anche negli interventi di restauro per ottenere un effetto diaframma di piano, connettendoli con le travi esistenti.
I pannelli a strati incrociati consistono in una successione di strati di tavole, disposti in direzioni ortogonali, incollati gli uni agli altri. Prove sperimentali hanno evidenziato che possiedono una rigidezza nel piano sufficiente per garantire un comportamento a diaframma e per resistere alle forze di taglio generate dalle azioni sismiche. La sovrapposizione ed il collegamento dei pannelli alle travi esistenti può quindi sostituire la soletta in calcestruzzo come intervento meno invasivo, meno pesante e maggiormente reversibile.

APPLICABILITÀ

I pannelli a strati incrociati (XLam o CLT) vengono utilizzati per costruire pareti e solai in edifici nuovi con struttura portante in legno, ma si stanno rivelando efficaci anche negli interventi di restauro per ottenere un effetto diaframma di piano, connettendoli con le travi esistenti.
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VANTAGGI / SVANTAGGI / RISCHI

I pannelli XLam sono generalmente realizzati da una serie di strati fino a raggiungere almeno 120 mm di spessore o spessori maggiori. In una recente campagna di ricerca sperimentale sono stati utilizzati pannelli speciali di 60 mm per poter essere impiegati specificamente in interventi di consolidamento, dove è importante non variare troppo le quote dei solai rispetto alla situazione esistente. I risultati sperimentali relativi alle prove di taglio nel piano sono illustrati in, dove sono evidenziati i contributi resistenti dovuti ai meccanismi a taglio e a torsione tra le tavole di strati diversi.

SINERGIE E INTERAZIONI

L'impiego dei pannelli XLam (o CLT) permette di sfruttare le loro proprietà meccaniche in combinazione con altri materiali e tecniche costruttive, migliorando la resistenza e la stabilità degli edifici. Nei progetti di restauro, i pannelli possono essere integrati con travi esistenti per creare diaframmi orizzontali, distribuendo efficacemente le sollecitazioni sismiche e preservando l'integrità strutturale. L'utilizzo di pannelli più sottili consente di mantenere le altezze originali dei solai, rispettando le caratteristiche architettoniche degli edifici storici. Inoltre, la prefabbricazione dei pannelli XLam riduce tempi e costi di costruzione, rendendoli ideali per soluzioni sostenibili e interventi di manutenzione reversibili.

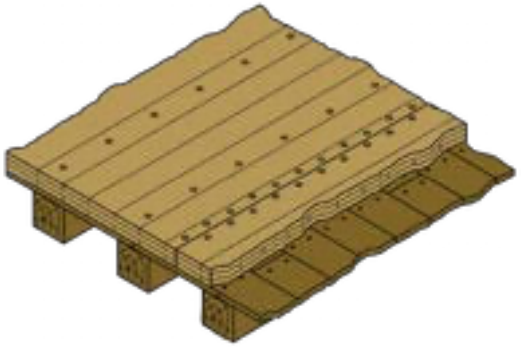
NORMATIVA DI RIFERIMENTO

NTC 2018

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 04 INTERVENTI CON CATENE E TIRANTI PER INCREMENTARE LA RIGIDEZZA FLESSIONALE E NEL PIANO

PRINCIPIO DI FUNZIONAMENTO

L'intervento consiste nell'inserimento di "cavi" metallici ancorati alle murature opposte al fine di garantire un comportamento monolitico del complesso edilizio. Queste barre vengono bloccate con l'ausilio delle piastre metalliche. Il tirante va teso per lavorare a trazione. Così facendo le pareti contrapposte lavoreranno insieme, resistendo di più alle onde sismiche.
I tiranti vengono utilizzati per due motivi, il primo per contrastare le spinte degli archi o delle volte, il secondo per solidarizzare tra loro le murature portanti.
Il tirante non è altro che un tondino di acciaio che viene collocato nella parte terminale della catena e serve a spingere l'uno contro l'altro i muri portanti, in modo da bilanciare l'azione della spinta.

APPLICABILITÀ

Spesso nelle strutture in muratura realizzate nell'antichità, anche se non ci sono archi, accade che le murature non sono tra loro ammorsate. Questa condizione fa venire a mancare quel comportamento scatolare. Pertanto, specie in caso di sisma, le murature non collaborando tra loro, potrebbero portare al crollo dell'edificio.

VANTAGGI / SVANTAGGI / RISCHI

Utilizzando questa tecnica avremo un miglioramento dello schema strutturale attraverso un funzionamento monolitico del complesso edilizio. Si ridurranno le spinte orizzontali trasmesse alle murature verticali dalle strutture spingenti e la struttura sarà più duttile (capacità di deformarsi prima di giungere a rottura).
Sono semplici da mettere in opera, poi – non intervenendo a livello strutturale dell'edificio – non alterano lo stato tensionale delle costruzioni.
Un ulteriore vantaggio risiede nel prezzo dei tiranti antisismici: sono relativamente economici perché non è necessario smantellare e ricostruire, non richiede l'acquisto e la messa in posa di materiali particolari e non è necessaria una manodopera specializzata, anche se bisogna rivolgersi a dei professionisti del settore per installare tiranti antisismici. Con poche centinaia di euro – manodopera esclusa – è possibile acquistare i propri collegamenti antisismici.

SINERGIE E INTERAZIONI

Le applicazioni dei tiranti antisismici sono molteplici:

- Incrementare la resistenza di una parete nel proprio piano;
- Ridurre la possibilità di ribaltamento fuori dal piano;
- Ridurre le spinte statiche di elementi spingenti (archi, volte, tetti, ...).

Le catene antisismiche comunque non risolvono i problemi strutturali degli edifici, per cui nelle nuove strutture la cosa migliore è quella di fare prevenzione antisismica, utilizzando materiali e tecniche innovative.

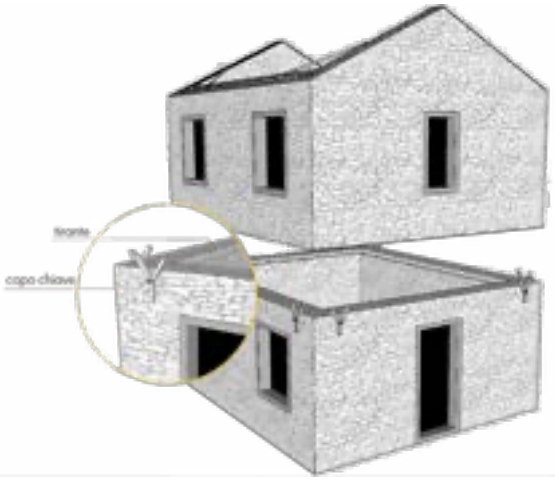
NORMATIVA DI RIFERIMENTO

NTC 2018

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 05 UTILIZZO DI CORDOLI SU SOLAI PER INCREMENTARE LA RIGIDEZZA FLESSIONALE E NEL PIANO

PRINCIPIO DI FUNZIONAMENTO

Spesso il solaio non è ben collegato alle murature, occorre quindi intervenire in questa direzione. L'intervento tipico consiste nella realizzazione di un elemento strutturale detto cordolo (elemento di calcestruzzo inserito per tutto lo spessore del muro in corrispondenza del solaio) per agganciare meglio il "pavimento". I cordoli possono essere realizzati: in muratura armata con acciaio, in muratura armata con FRP, in acciaio, in cemento armato.

APPLICABILITÀ

Il cordolo, nella tipologia di esecuzione più ricorrente in cemento armato (c.a.), è da sempre un elemento di collegamento suggerito e proposto in molte linee guida e norme tecniche per il recupero strutturale degli edifici in muratura lesionati da eventi sismici.
Esso rappresenta un elemento di coronamento e legatura molto utile al raggiungimento del corretto comportamento scatolare dell'edificio in muratura, soprattutto nei riguardi delle azioni sismiche. Il cordolo in c.a. può essere sia sommitale, ovvero riguardante la legatura della scatola muraria a livello di copertura, sia di interpiano per la legatura delle pareti tra due solai in continuità con l'inserimento di nuovi solai in laterocemento quando questi venivano prescritti in sostituzione degli antichi solai lignei.

VANTAGGI / SVANTAGGI / RISCHI

Il cordolo oltre a favorire il comportamento scatolare realizzando un collegamento continuo tra gli elementi strutturali (pareti, pareti-solai, pareti-coperture). Per comprendere bene il concetto di comportamento scatolare è sufficiente esaminare una semplice scatola realizzata in carta:1) ogni parete, cioè ogni foglio esaminato singolarmente, offre scarsa resistenza alle sollecitazioni;2) collegando le pareti tra loro si ottiene un considerevole aumento di resistenza;3) la presenza di un elemento orizzontale (coperchio) aumenta ancora la resistenza globale.

Inoltre, il cordolo se applicato in sommità limita la vulnerabilità delle pareti per le azioni fuori dal piano. Nella pratica quando sono stati adottati cordoli in c.a. in sommità insieme a coperture in latero-cemento si sono verificati collassi fuori dal piano delle parti sommatali delle pareti murarie. Tale comportamento è dovuto al forte incremento di rigidezza che da una parte richiama una maggiore forza sismica ed all'aumento di differenza di rigidezza tra copertura e parete.

SINERGIE E INTERAZIONI

Col tempo, a fianco della tradizionale tecnica del c.a., sono maturate nuove ed alternative soluzioni costruttive per ovviare alla eccessiva rigidezza della soluzione tradizionale. Oggi il progresso delle tecnologie consente anche di eseguire cordolature sommitali con materiali e tecniche diverse, ad esempio in muratura armata, in muratura lamellare mediante rinforzo dei giunti di malta con materiali compositi, oppure in acciaio mediante tassellatura perimetrale di profili metallici. Tutte soluzioni valide se verificate con il contesto storico-edilizio. In tutti i casi occorre prestare grande attenzione alla qualità della tessitura muraria su cui si esegue il cordolo e si inseriscono le barre di inghisaggio verticale.

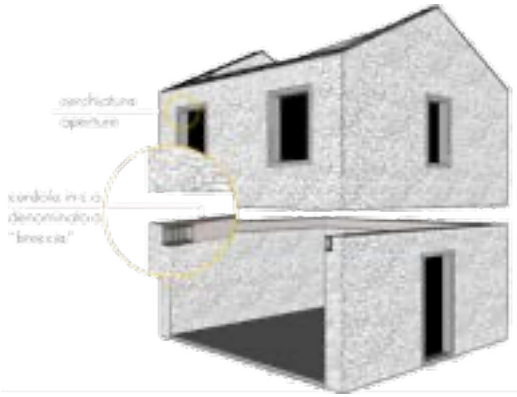
NORMATIVA DI RIFERIMENTO

NTC 2018 , DPCM 9/2/2011

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 06 UTILIZZO DI INTONACO ARMATO

PRINCIPIO DI FUNZIONAMENTO

L'intervento consiste nel realizzare, in aderenza alla superficie muraria, delle lastre di intonaco armate con una rete metallica o fibra di vetro, o di altro materiale ad alta resistenza, e rese solidali alla muratura (attraverso tiranti passanti in acciaio).
L'intonaco armato, noto anche come CRM (Composite Reinforced Mortar), è una soluzione utilizzata per rinforzare la struttura di muri. Consiste in una rete preformata in composito (FRP) inserita in una malta ad uso strutturale e applicata sulla superficie dell'elemento murario da rinforzare.
La rete in FRP è in grado di assorbire gli sforzi di trazione mentre la malta strutturale contribuisce a assorbire gli sforzi di compressione. La collaborazione strutturale tra l'elemento murario e l'intonaco armato è garantita anche dalla presenza di connettori che trasferiscono gli sforzi.
La stessa malta può contenere additivi come microfibre polimeriche, che aumentano la resistenza e la durabilità del rinforzo. L'intonaco armato è un'opzione efficace per aumentare la resistenza della struttura e prevenire problemi come fessurazioni o cedimenti del muro.

APPLICABILITÀ

L'intonaco armato o CRM è utile in caso di murature danneggiate: permette di rafforzare la parete.
Il placcaggio delle murature con intonaco armato è una tecnica utilizzata per rinforzare e riparare murature gravemente danneggiate e incoerenti, sulle quali non è possibile intervenire efficacemente con altre tecniche. Inoltre, può essere utilizzato anche per porzioni limitate di muratura pesantemente gravate dai carichi verticali.
L'utilizzo dell'intonaco armato è consigliato quando si riscontrano problemi di stabilità o resistenza della struttura. In genere, l'intonaco armato è adatto per muri in sofferenza che presentano fessurazioni e crepe, che possono essere causate da una struttura troppo sottile o sovraccarica.

VANTAGGI / SVANTAGGI / RISCHI

L'intonaco armato incrementa la resistenza e la duttilità senza modificare l'equilibrio delle pareti. Ha un basso costo di esecuzione e la posa è semplice. Di contro, l'intervento presenta anche notevoli svantaggi: modifica della rigidezza e quindi della risposta sismica; aumento di massa; alterazione dell'aspetto esteriore della muratura.

SINERGIE E INTERAZIONI

Un'attenta analisi del professionista è necessaria per determinare se l'intonaco armato è la soluzione più adatta per il problema in questione. In alcuni casi, potrebbero essere necessari altri tipi di interventi, come la messa in tensione o il rinforzo strutturale.

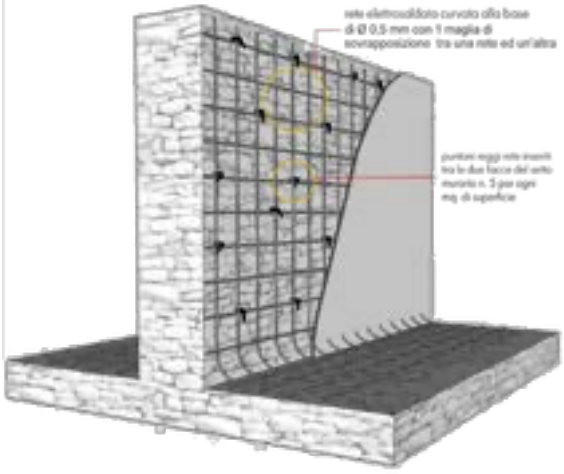
NORMATIVA DI RIFERIMENTO

NTC 2018 , DPCM 9/2/2011

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 07 CUCITURA DELLA MURATURA

PRINCIPIO DI FUNZIONAMENTO

Questo intervento consiste nella cucitura armata mediante "impacchettamento" della muratura con nastri in acciaio inox disposti nelle direzioni orizzontale e verticale, passanti attraverso lo spessore murario, e richiusi su se stessi attraverso reggette previa applicazione di una pretensione.

APPLICABILITÀ

Un buon metodo che garantisce meglio degli altri il raggiungimento di una monoliticità ottimale, oltre ad un buon comportamento meccanico del pannello murario, incrementandone come si è rilevato da prove sperimentali, la resistenza a taglio e flessione nel piano e fuori dal piano è il CAM.
Per CAM s'intende un sistema di cucitura attiva delle murature, attuato mediante fettucce in acciaio passanti, con passo adeguato alla resistenza che necessita assegnare al pannello murario.
Questo sistema, ha il pregio di far partecipare allo sforzo resistente tutta la muratura, mediante una tecnica poco invasiva e di semplice realizzazione.

VANTAGGI / SVANTAGGI / RISCHI

Incrementa la resistenza e la duttilità, in modo analogo all'intervento con intonaco armato. Differentemente da quest'ultimo, però, non ne presenta le controindicazioni: comporta, infatti, una variazione di massa trascurabile, presenta interazioni minime con gli impianti e permette una regolare evaporazione dell'acqua di risalita capillare. Incremento di capacità nei confronti del collasso per schiacciamento grazie all'azione benefica delle forze di coazione.
Rispetto ai metodi che impiegano armature metalliche facilmente ossidabili nel tempo, il CAM ha il vantaggio di una durabilità pressocchè illimitata, in quanto impiega fettucce in acciaio inox passanti nel corpo murario, praticamente inalterabili nel tempo.

SINERGIE E INTERAZIONI

Il sistema garantisce la continuità orizzontale e verticale, senza incremento delle masse e richiedendo solamente un minimo numero di fori passanti.
La cucitura delle murature: una cucitura su pannello in mattoni pieni. Il pannello murario così consolidato, è messo al riparo dal pericolo della separazione degli elementi, in seguito a forti sollecitazioni, inoltre, particolare ed immediata efficacia si ottiene nel cerchiaggio di pilastri ed elementi isolati.
La flessibilità dell'acciaio, permette alle cuciture di seguire anche percorsi non rettilinei all'interno di murature, quando occorre evitare ostacoli di varia natura. Infine il ridotto spessore delle cuciture, ne consente il contenimento all'interno degli spessori usuali di intonaco, senza alterare l'aspetto estetico della muratura.

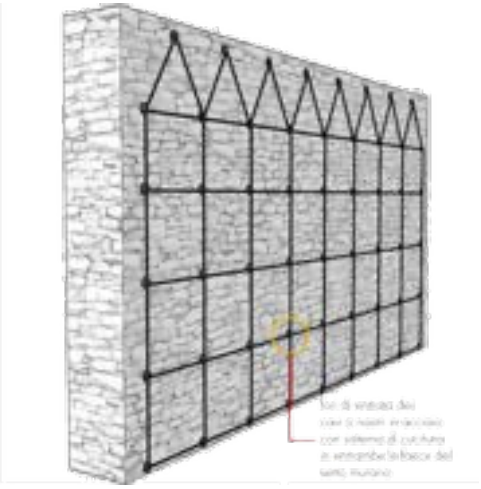
NORMATIVA DI RIFERIMENTO

NTC 2018 , DPCM 9/2/2011

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 08 CUCI - SCUCI

PRINCIPIO DI FUNZIONAMENTO

I tipi di intervento di recupero più ricorrenti per ripristinare l'aspetto superficiale delle pareti in mattoni faccia a vista sono costituiti dalla sostituzione dei mattoni deteriorati con altri aventi le medesime caratteristiche, detta appunto cuci-scuci, e dal rifacimento dei giunti mediante costipazione o rigiuntaggio.

APPLICABILITÀ

Le pareti perimetrali sono particolarmente soggette a deterioramenti causati da aggressioni provocate dalle condizioni ambientali e da altre cause concomitanti. Questi deterioramenti non interferiscono sul comportamento statico, ma producono spesso il degrado, più o meno rapido e più o meno vistoso, dell'aspetto della superficie esterna. Limitando l'esame al degrado delle pareti in muratura, si può osservare che le murature di mattoni subiscono disgregazioni della malta dei giunti e scagliature (o squamature) dei mattoni. L'espressione cuci-scuci indica il susseguirsi di demolizioni e di ricostruzioni per piccoli tratti di una muratura. La tecnica d'intervento della muratura in sostruzione, detta anche a cuci scuci, consente di ripristinare la continuità strutturale di una muratura in mattoni faccia a vista mediante la sostituzione delle parti degradate senza pregiudicarne la funzione portante durante lo svolgimento dei lavori. La tecnica del cuci-scuci è però impiegabile quando il degrado è limitato a zone ben definite della muratura.

VANTAGGI / SVANTAGGI / RISCHI

L'intervento di cuci-scuci ha inizio con la demolizione di un primo tratto di muratura (il cosiddetto strappo in breccia) e prosegue con l'immediato rifacimento di tale muratura, ammorsandola ai lati e forzandola sul lato superiore al disotto della parte rimanente mediante cunei che verranno sostituiti da mattoni e malta quando sarà concluso il ritiro della parte ricostruita nella prima zona. Successivamente vengono ripetute le stesse operazioni di demolizione e di sostituzione, agendo in zone non contigue.
Il cuci-scuci, come già accennato, deve essere preceduto da una accurata e attenta fase di diagnosi per valutare la fattibilità dell'operazione in relazione alle possibili rotture o crolli. Si procede quindi per sezioni successive in aree di limitata estensione, evitando l'indebolimento dell'involucro edilizio esistente.

SINERGIE E INTERAZIONI

L'intervento del cuci scuci è forse una delle misure di riparazione più antica, in quanto prevede una regolarizzazione della tessitura muraria nel suo paramento, frontale o nel proprio spessore.
Sicuramente è un metodo che ha un'efficacia locale e che difficilmente può essere applicato in modo diffuso.
difficilmente si applica in modo diffuso ed esteso, in quanto è concepito come una vera e propria riparazione, ovvero cucitura, per risarcire una lesione o ripristinare una tessitura o regolarizzarla.

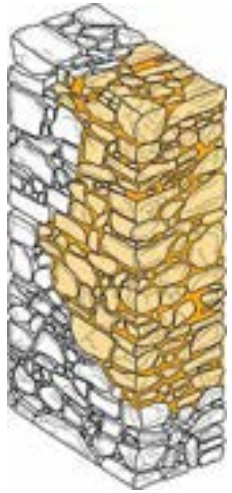
NORMATIVA DI RIFERIMENTO

NTC 2018 , DPCM 9/2/2011

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 09 APPLICAZIONE DEL METODO DEL PROF. G. MOCHI

PRINCIPIO DI FUNZIONAMENTO

Un protocollo per la valutazione della vulnerabilità sismica degli aggregati edilizi dei centri storici, che consenta la pianificazione delle operazioni di riduzione del rischio ed il monitoraggio delle condizione di sicurezza. Partendo dal riconoscimento del ruolo essenziale che la qualità costruttiva svolge nel garantire significativi livelli di protezione e dell'importanza rivestita dai processi di trasformazione dell'edilizia storica, quali principali elementi di potenziale riduzione delle prestazioni strutturali, viene proposto un protocollo operativo che si articola in fasi di analisi alla scala urbana, ricerche archivistiche e rilievi della consistenza edilizia, per giungere alla elaborazione di indicatori sintetici di criticità che concorrono alla definizione di un indice di vulnerabilità atto ad individuare la predisposizione al danno di ogni singolo aggregato.

APPLICABILITÀ

La metodologia può essere applicata in tutte le tipologie di aggregati edilizi e prevede delle fasi specifiche:
- Fase conoscitiva (geometria ed evoluzione degli aggregati);
- Individuazione delle vulnerabilità in pianta e in alzato;
- Previsione dei possibili scenari di danno;
- Valutazione analitica;
- Valutazione speditiva;
- Creazione della Mappa del Rischio Sismico.

VANTAGGI / SVANTAGGI / RISCHI

La vulnerabilità ai terremoti rileva il livello di resistenza di un edificio in rapporto al sisma. Più precisamente è un valore numerico che riassume le capacità di resistenza e di spostamento di un'abitazione allo scatenarsi di un terremoto.
La valutazione si basa sulle direttive presenti all'interno delle Norme Tecniche per le Costruzioni relative agli edifici esistenti che prendono in considerazione:

- l'analisi storico-critica della costruzione;
- il rilievo strutturale;
- le caratteristiche meccaniche dei materiali utilizzati;
- la definizione dei livelli di conoscenza;
- l'analisi strutturale;
- la vulnerabilità della struttura esistente;
- quali interventi sono necessari per adeguare la struttura effettuando anche una valutazione dei costi da affrontare rapportati ai vantaggi che si ottengono.

SINERGIE E INTERAZIONI

L'analisi di vulnerabilità sismica è lo strumento principale per comprendere in modo dettagliato lo stato di fatto di un edificio, a livello strutturale, in relazione alla resistenza alle azioni sismiche.
Infatti, lo scopo di quest'analisi è di analizzare la resistenza del fabbricato mettendo in luce le sue eventuali debolezze e descrivere tali dettagli in una relazione che prende il nome di Analisi di Vulnerabilità.

NORMATIVA DI RIFERIMENTO

NTC 2018

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI previene

SPECIFICHE TECNICHE

IL METODO CONSIGLIATO NECESSITA DI UN APPROFONDIMENTO DA PARTE DI UN TECNICO ABILITATO

In. 10 REALIZZAZIONE DI BARRIERE FISICHE DI RISALITA

PRINCIPIO DI FUNZIONAMENTO

La realizzazione di una barriera alla risalita capillare prevede l'interruzione del passaggio di umidità tramite il taglio fisico della muratura e l'inserimento al suo interno di materiali anticapillari. Il taglio, esteso per brevi tratti ravvicinati per ragioni statiche, viene eseguito a circa 15-20 cm dal suolo con carotatrici, seghe o fili diamantati, a seconda delle caratteristiche costruttive e del grado di deterioramento della struttura: le carotatrici sono adatte per muri di notevole spessore e/o di tipo misto, oppoure nel caso in cui siano da evitare urti ed eccessive vibrazione; la sega viene impiegata soprattutto per la muratura, mentra il filo diamantato risulta utile nel caso di murature molto compatte. Prima dell'intervento, la rimozione dell'intonaco imbibito, interno ed esterno, permette la più rapida evaporazione dell'umidità. Nel taglio si introducono materiali impermeabili quali lamine metalliche piane o ondulate, materiali plastici, manti bituminosi o in vetroresina, malte cementizie impermeabili; nel caso di tagli con carotatrici, piccolo e ravvicinati, si immettono soprattutto materiali fluidi, come cemento o resine; per gli altri tagli possono impiegarsi materiali in lamina. In alternativa al taglio, per pareti di spessore contenuto, è possibile inserire le lamine con un martello pneumatico.

APPLICABILITÀ

Il taglio fisico della murature rappresenta un intervento invasivo rispetto alla statica dell'edificio, sia in fase d'opera (per la possibilità di vibrazioni) sia in fase di esercizio. Inoltre, presuppone la rottura, per quanto circoscritta, di una porzione di involucro, per cui può essere realizzato solo nel caso in cui non alteri eccessivamente il carattere storico-artistico della fabbrica. L'intervento risulta più semplice nel caso di pareti in mattoni, in cui il taglio può essere realizzato in corrispondenza dei giunti di malta.

VANTAGGI / SVANTAGGI / RISCHI

Il sistema del taglio fisico, grazie all'inserimento di materiali anticapillari interposti, garantisce il prosciugamento della muratura nella parte soprastante il taglio e impedisce la nuova formazione di umidità. Nondimeno, l'esecuzione è molto dedicata e laboriosa e può comportare notevoli inconvenienti in fase di esecuzione de l'edificio è abitato, soprattutto nel caso di utilizzo di martelli pneumatici. Inoltre, il sistema non contrasta l'imbibimento idrico della muratura al di sotto della barriera a contatto con il terreno; a livello locale la situazione potrebbe anche peggiorare, avendo diminuito la superficie evaporante della muratura. In più l'alterazione dell'equilibrio idraulico della muratura fino alla barriera può avere conseguenze generali sul comportamento termigrometrico dell'edificio. Altri problemi riguardano la possibile penetrazione della pioggia in corrispondenza del taglio e il mantenimento di percorsi laterali, quali gli intonaci di finitura esterna, per la risalita capillare.

SINERGIE E INTERAZIONI

I sistemi di interruzione della risalita capillare possono integrarsi con i metodo di evacuazione dell'acqua in eccesso e con la riduzione preventiva della condensa interstiziale e superficiale, attuata tramite il corretto isolamento dell'involucro, in particolar modo utilizzando sistemi a cappotto esterno.

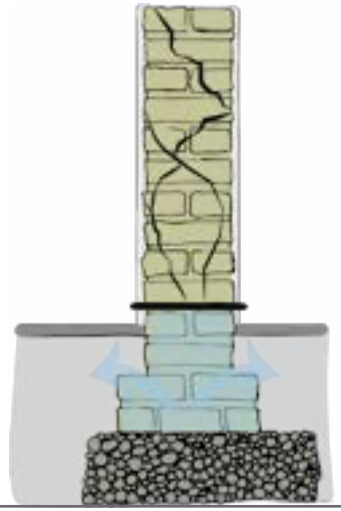
NORMATIVA DI RIFERIMENTO

UNI 10859:2000, UNI 11085:2003

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI rinforza

SOLUZIONE CONFORME



In. 11 REALIZZAZIONE DI BARRIERE CHIMICHE ALLA RISALITA CAPILLARE

PRINCIPIO DI FUNZIONAMENTO

L'intervento chimico, analogamente al taglio fisico, ha l'obiettivo di bloccare la risalita dell'umidità alla base della muratura. In questo caso, la barriera viene realizzata introducendo nella muratura sostanze liquide che vengono assorbite per capillarità e polimerizzano all'interno dei capillare del materiale, costituendo una lastra di separazione, senza però provocare l'inconveniente traumatico del taglio di tutta la muratura perimetrale dell'edificio. I materiali utilizzati hanno effetto idrofobizzante, cioè stimolano il prevalere delle forze di coesione delle moleco d'acqua alle forze di attrazione solido-liquido, con il risultato di evitare la suzione capillare dell'acqua. I principali formulati chimici utilizzati sono siliconi, resine siliconiche, poliesteri.
Le tecniche di intervento si diversificano in base ai due procedimenti di impregnazione: a lenta trasfusione e a iniezione. I sistemi a lenta trasfusione prevedono l'introduzione del formulato chimico mediante trasfusori, inseriti nei fori realizzati alla base della parete umida; in questo caso, il liquido impregnante viene immesso lentamente, risalendo in parte all'interno della muratura di un formato diluito in solvente che viene iniettato a bassa pressione mediante una pompa, facilitando l'espulsione dai pori già saturi dell'acqua in essa contenuta.

APPLICABILITÀ

Il sistema della barriera chimica è meno invasivo sui caratteri statici della muratura rispetto al taglio fisico; per questa ragione, è maggiormente indicato nel caso di edifici abitati e/o obicati in aree a elevata densità. Il metodo a lenta trasfusione viene adottato nel caso le murature non siano eccessivamente umide o presentino elevate quantità di sali; a fronte di una durata consistente del processo, l'effetto di impermeabilizzazione è molto efficace, in quanto la diffusione della soluzione avviene prevalentemente per capillarità e tutti i pori sono resi idrorepellenti. Per murature continue o compatte si utilizza normalmente l'iniezione, in quanto il liquido tende a diffondersi in maniera più omogenea.

VANTAGGI / SVANTAGGI / RISCHI

Analogamente al taglio fisico, la barriera chimica garantisce il prosciugamento della muratura nella parte soprastante e impedisce la nuova formazione di umidità; inoltre, non compromette generalmente la statica dell'edificio. Gli svantaggi sono legati all'onerosità dell'intervento, che può essere imbrattante e deve essere rinnovato periodicamente. In più, il sistema non contrasta l'imbibimento idrico della muratura al di sotto della barriera a contatto con il terreno; a livello locale la situazione potrebbe anche peggiorare, avendo diminuito la superficie evaporante della muratura.

SINERGIE E INTERAZIONI

I sistemi di interruzione della risalita capillare possono integrarsi con i metodi di evacuazione dell'acqua in eccesso e con la riduzione preventiva della condensa interstiziale e superficiale, attuata tramite il corretto isolamento dell'involucro, in particolar modo utilizzando sistemi a cappotto esterno.

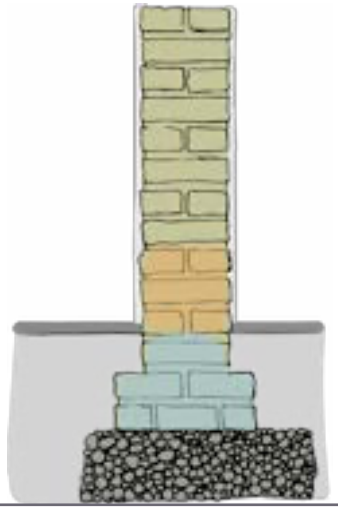
NORMATIVA DI RIFERIMENTO

UNI 10859:2000, UNI 11085:2003

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 12 REALIZZAZIONE DI SISTEMI ELETTROCHIMICI DI EVACUAZIONE DELL'UMIDITÀ

PRINCIPIO DI FUNZIONAMENTO

I sistemi di evacuazione favoriscono la fuoriuscita dell'acqua delle pareti, aumentano la capacità di evaporazione della muratura tramite intonaci macroporosi, oppure sfruttando la diversa polarità tra muro e terreno per ottenere, attraverso il collocamento di elettrodi, una inversione di tendenza alla naturale risalita capillare. Il principio su cui si basa la tecnologia degli intonaci macroporosi è quello di aumentare artificialmente la porosità dei normali intonaci con specifici additivi aeranti; sono in genere costituiti da legante idraulico (spesso cementizio), aggregati e additivi pirogeni in polvere. L'intonaco così formulato risulta estremamente poroso con una struttura formata da macropori messi in comunicazione tra loro da una rete di capillari; in questo modo, si rende possibile il trasporto di acqua in fase liquida all'interno della struttura verso l'intonaco esterno e l'evaporazione dell'acqua quando raggiunge i macropori.
I sistemi elettro-fisici prevedono l'impiego di apparecchiature elettriche per la deumidifcazione attiva. Nel muro grezzo viene praticata orizzontalmente una scanalatura di 1-2 cm di profondità in cui vengono inserite sonde conduttrici o un filo continuo di materiale conduttore. I metodi elettro-osmotici consistono nell'invertire la differenza di potenziale che si crea spontaneamente nella muratura mediante l'applicazione di un flusso costante di corrente continua a basso voltaggio, in modo da attrarre l'acqua ed i sali nel sottosuolo, impedendo la risalita dell'acqua nella muratura. Alternativamente, può essere emesso un debole campo elettromagnetico a basso voltaggio che interagisce con la polarità dell'acqua, provocando forze di repulsione che respingono l'umidità verso il terreno attraverso i capillari della muratura.

APPLICABILITÀ

I sistemi di evacuazione hanno un'applicazione onersoa e complessa a fronte di un'invasività quasi nulla, che permette di evitare alterazioni al carattere storico-artistico della fabbrica. L'impiego di intonaci macroporosi è efficace nel caso in cui l'umidità di risalita sia dovuta a eventi periodicci e gli spessori murari siano limitati; le apparecchiature elettrofisiche hanno un campo di applicazione molto più esteso, ma il loro funzionamento non è garantito soprattutto in presenza di correnti vaganti, quali linee ferroviarie, tranviarie, ecc.

VANTAGGI / SVANTAGGI / RISCHI

I sistemi di evacuazione (soprattutto i sistemi elettrici) offrono buone garanzie di prosciugamento generalizzate e non sono invasivi, non prevedendo opere murarie. Gli svantaggi maggiori sono legati agli altri costi energetici ed economici di esercizio; inoltre, la creazione di campi elettromagretici può avere un possibile effetto biologico negativo e ha un raggio d'azione inversamente proporzionale alla distanza dalle sonde.

SINERGIE E INTERAZIONI

I sistemi di evacuazione sono maggiormente efficienti se abbinati ad un elevato grado di areazione dei locali interni. Possono esserre integrati con barriere alla risalita capillare e con la riduzione preventiva della condensa interstiziale e superficiale tramite il corretto isolamento dell'involucro.

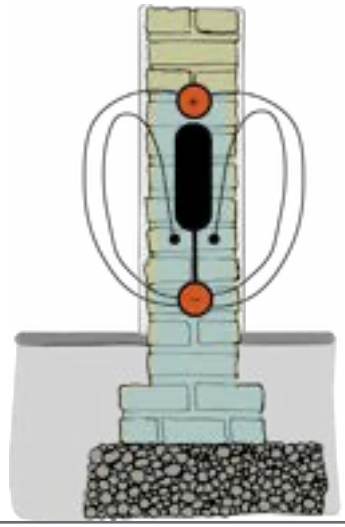
NORMATIVA DI RIFERIMENTO

UNI 10859:2000, UNI 11085:2003

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 13 SISTEMI DI EVACUAZIONE DELL'UMIDITÀ CON INTONACI DEUMIDIFICANTI

PRINCIPIO DI FUNZIONAMENTO

L'intonaco deumidificante o macroporoso viene spesso proposto come soluzione economica per risolvere i problemi di umidità di risalita. La verità è che l'intonaco deumidificante è in grado di fare evaporare l'acqua dal muro ma non riesce in nessuna maniera a bloccare l'umidità di risalita.
Si tratta di uno speciale intonaco dotato di pori di dimensioni maggiori rispetto ad un intonaco tradizionale. Questo intonaco è in grado di far fuoriuscire l'acqua sotto forma di vapore e di impedire al sale di fuorius.

APPLICABILITÀ

È essenziale che gli interventi di preparazione dei supporti comprendano:
- l'asportazione in profondità di almeno 2 cm di malta d'allettamento
- l'asportazione della "crosta salina". Il metodo più efficace per la rimozione è la sabbiatura o l'idrosabbiatura e, se non fosse possibile utilizzare questi sistemi, si potrà abradere la superficie coadiuvandosi con una soluzione di acqua ed alcol al fine di rimuovere il più possibile i depositi derivati dalle subefflorescenze.
Negli interventi più "nobili" si possono utilizzare anche impacchi che assorbono una buona parte di sali presenti oppure lavaggi con acqua deionizzata.
È importante sottolineare che in qualsiasi intervento di risanamento la preparazione dei supporti è essenziale per la durabilità e nessun prodotto potrà mai sostituire questa importante fase del lavoro di risanamento, almeno a nostra conoscenza sino ad oggi.

VANTAGGI / SVANTAGGI / RISCHI

L'intonaco deumidificante o macroporoso risulta essere utile in queste situazioni:
- se associato ad una deumidificazione definitiva all'umidità di risalita come ad esempio l'iniezione di una barriera chimica;
- se associato ad una deumidificazione definitiva mediante centralina elettrofisica;
- per fare evaporare l'acqua da un muro dove si è presentata una perdita da un tubo o in seguito ad una alluvione;

SINERGIE E INTERAZIONI

Le formulazioni degli intonachi deumidificanti in questi decenni sono variate notevolmente, e quelli che hanno comunque dato i migliori risultati in pratica sono quelli definiti "macroporosi" cioè con una distribuzione interna di pori che superano di molto il normale volume medio di aria presente nelle comuni malte da intonaco.
Gli intonaci macroporosi, grazie anche alla "riserva di vuoti" presenti nella loro matrice, permettono di assorbire le tensioni derivanti dall'eventuale presenza dei sali evitando o opponendosi alla disgregazione derivante dall'azione espansiva di cristallizzazione.

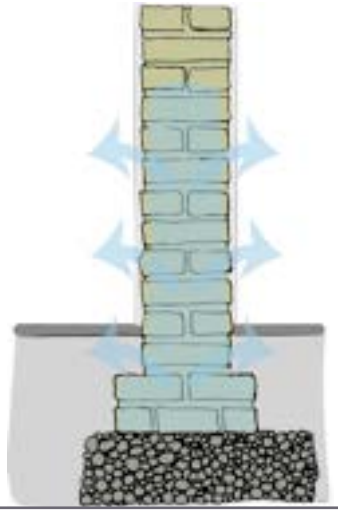
NORMATIVA DI RIFERIMENTO

UNI 10859:2000, UNI 11085:2003

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 14 SISTEMI DI EVACUAZIONE DELL'UMIDITÀ CON VESPAIO AREATO

PRINCIPIO DI FUNZIONAMENTO

Il vespaio aerato permette di bloccare la risalita di gas radon facendolo uscire all'esterno dell'edificio: l'intercapedine vuota raccoglie il gas disperdendolo nell'aria all'interno del vespaio e successivamente la ventilazione naturale (o meccanica) lo fa uscire all'esterno riducendo al minimo la possibilità che entri all'interno dell'abitazione.

APPLICABILITÀ

Le funzioni principali sono:
- impermeabilizzare contro l'umidità di risalita creando un distacco tra il terreno e l'edificio, permettendo all'aria di circolare e quindi di portar via l'umidità;
- convogliare all'esterno dell'edificio del Radon, gas radioattivo inodore e incolore generato da alcune rocce terrestri;
- permettere il passaggio sotto la soletta di cavi, tubazioni ed impianti;
- isolare termicamente. Il nuovo solaio sopra il vespaio, dovrà rispettare determinati requisiti di legge volti al risparmio energetico.

Il tutto dovrà essere attestato attraverso la relazione energetica nota come "legge 10".

VANTAGGI / SVANTAGGI / RISCHI

Il vespaio areato ha sicuramente dei vantaggi in termini di maggiore efficienza energetica e salubrità degli ambienti, ma realizzarlo in fase di costruzione dell'immobile o successivamente sono due interventi che hanno un'invasità e un impatto economico nettamente diverso.
I vantaggi del vespaio areato sono: Semplicità e rapidità di realizzo; Offre la possibilità di alloggiamento degli impianti; Colma senza difficoltà i dislivelli; Permette di creare un distacco tra getto e terreno; Impedisce l'umidità di risalita; Riesce a smaltire un'eventuale presenza di gas radon; Garantisce una maggiore efficienza energetica; Conserva salubri gli ambienti; È poco costoso ed ecosostenibile.
Gli svantaggi del vespaio areato: Non elimina il fenomeno di umidità capillare nelle murature; Non assicura risparmio energetico; Non garantisce l'ecosostenibilità; Non mantiene gli ambienti salubri;
Se non viene realizzato con la giusta competenza potrebbe creare altri problemi di umidità; Non è una soluzione definitiva.

SINERGIE E INTERAZIONI

Può essere applicato per:
- Nuove abitazioni;
- Edifici pubblici;
- Ristrutturazioni di pavimentazioni;
- Siti inquinati;
- Ogni tipo di fondazione e pavimentazione.

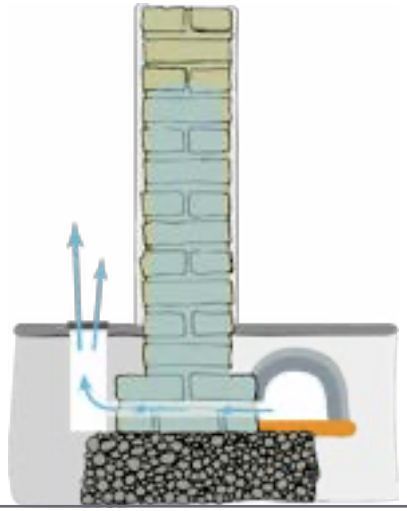
NORMATIVA DI RIFERIMENTO

UNI 10859:2000, UNI 11085:2003

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 15 MIGLIORAMENTO DELLE CARATTERISTICHE MECCANICHE DEL TERRENO CON INIEZIONI

PRINCIPIO DI FUNZIONAMENTO

L'improvamento delle caratteristiche meccaniche del terreno tramite iniezioni è una tecnica geotecnica utilizzata per rinforzare il terreno e migliorare le sue proprietà meccaniche. Il processo coinvolge l'iniezione di un materiale appropriato nel terreno in modo da aumentarne la coesione, la portanza o altre caratteristiche desiderate.
Selezione del Materiale d'Iniezione: Viene selezionato un materiale adatto per l'iniezione, che può essere una miscela di cemento e acqua (cementazione), resine, schiume o altri agenti consolidanti.
Preparazione del Terreno: La zona di terreno in cui si desidera migliorare le caratteristiche meccaniche viene preparata, ad esempio, tramite trivellazione di fori verticali o inclinati.
Iniezione del Materiale: Il materiale d'iniezione viene pompato nei fori precedentemente perforati. Questo può essere fatto a pressione per garantire che il materiale si diffonda uniformemente nel terreno circostante.
Indurimento o Consolidamento: Una volta iniettato nel terreno, il materiale d'iniezione inizia ad indurirsi o consolidarsi, creando una massa solida o una zona rinforzata all'interno del terreno.
Miglioramento delle Caratteristiche: Il terreno circostante viene influenzato dalla presenza del materiale iniettato, il che può migliorare le sue proprietà meccaniche, come la portanza, la coesione o la resistenza alla compressione.

APPLICABILITÀ

Questa tecnica viene utilizzata in una serie di applicazioni:
Per migliorare la capacità portante del terreno sotto edifici o strutture, evitando il cedimento.
Per affrontare problemi di consolidamento differenziale del suolo in edifici esistenti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Aumenta la portanza e la stabilità del terreno, riducendo il rischio di cedimento o frane.
Spesso richiede meno scavi rispetto ad altre tecniche di miglioramento del terreno.
Il processo può essere eseguito in tempi relativamente brevi, riducendo i ritardi nella costruzione.
Svantaggi/Rischi: Può essere costoso, soprattutto per grandi progetti. È importante garantire una corretta progettazione e un controllo rigoroso durante l'esecuzione per evitare problemi. Un uso improprio o una cattiva esecuzione delle iniezioni potrebbero causare danni alle strutture circostanti o al terreno circostante.

SINERGIE E INTERAZIONI

L'uso congiunto di sistemi di drenaggio può aiutare a mantenere le prestazioni a lungo termine delle iniezioni, evitando l'accumulo di acqua nel terreno. Deve essere coordinato con la progettazione strutturale per garantire che il rinforzo del terreno sia adeguato per le esigenze dell'edificio o dell'infrastruttura. In alcuni casi, le geotessiture possono essere utilizzate in combinazione con le iniezioni per ulteriore rinforzo del terreno.

NORMATIVA DI RIFERIMENTO

ISO 22477 - EN 12715 - EN 12716 - EN 14488 - EN 12718

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME

Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 16 OPERE DI SOSTEGNO PER IMPEDIRE IL RIFLUIMENTO LATERALE DEL TERRENO

PRINCIPIO DI FUNZIONAMENTO

Le opere di sostegno per impedire il rifluimento laterale del terreno sono strutture ingegneristiche progettate per prevenire il cedimento o il movimento laterale del terreno, spesso su pendii o terreni inclinati. Queste opere possono includere diversi tipi di strutture, ciascuna con un principio di funzionamento specifico:

Muri di Sostegno: I muri di sostegno, come i muri di sostegno a gravità, i muri di sostegno con tiranti, o i muri di sostegno a contrafforti, utilizzano il loro peso o l'ancoraggio per contrastare la pressione laterale del terreno. Riducono il movimento del terreno e prevengono il cedimento.

Pali di Ancoraggio: I pali di ancoraggio sono elementi strutturali profondamente conficcati nel terreno per stabilizzare il terreno sopra di essi. Questi pali creano una resistenza alla trazione che impedisce al terreno di muoversi lateralmente.

Tiranti e Rinforzi: Tiranti e rinforzi come le reti metalliche o i geogriglie vengono utilizzati per distribuire le tensioni nel terreno e migliorare la sua stabilità.

Opere di Drenaggio: Sistemi di drenaggio adeguati, come dreni o tubi di drenaggio, vengono spesso utilizzati per rimuovere l'acqua dal terreno e ridurre la pressione idrostatica che può causare il movimento laterale.

APPLICABILITÀ

Le opere di sostegno per impedire il rifluimento laterale del terreno sono applicabili in una serie di contesti:

Taludes o pendii instabili: Possono essere utilizzate per prevenire frane o cedimenti su pendii inclinati.

Strade e autostrade: Spesso vengono utilizzate per evitare il cedimento del terreno lungo le strade e autostrade in zone montuose o soggette a erosione.

Progetti di costruzione e fondazioni: Possono essere necessarie per garantire la stabilità del terreno durante la costruzione di edifici o infrastrutture.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Impediscono il cedimento o il movimento laterale del terreno, migliorando la sicurezza e la stabilità. Consentono di aumentare la capacità portante del terreno su cui sono installate. Proteggono edifici, strade e altre infrastrutture da danni causati da instabilità del terreno.

Svantaggi/Rischi: Possono essere costose da progettare, costruire e mantenere. Richiedono una progettazione precisa e una conoscenza geotecnica approfondita per evitare errori. Possono avere un impatto sull'ambiente circostante, specialmente se non sono progettate o costruite correttamente.

SINERGIE E INTERAZIONI

L'uso congiunto di sistemi di drenaggio può migliorare l'efficacia delle opere di sostegno riducendo la pressione idrostatica. Le opere di sostegno devono essere progettate in sinergia con le strutture sovrastanti o adiacenti, come muri di contenimento o fondazioni. Spesso è necessario monitorare le opere di sostegno nel tempo per rilevare eventuali movimenti o deformazioni e intraprendere azioni correttive, se necessario.

NORMATIVA DI RIFERIMENTO

ISO 14688 e ISO 14689 - Eurocodice 7 (EN 1997) - ASTM D2487 - AS 4678

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME

Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 17 MODIFICA DELLA DISTRIBUZIONE DEI CARICHI DELLA STRUTTURA

PRINCIPIO DI FUNZIONAMENTO

La modifica della distribuzione dei carichi della struttura è una tecnica ingegneristica che comporta la modifica delle forze applicate su una struttura al fine di migliorare le sue prestazioni o risolvere problemi di carico. Questo può essere ottenuto attraverso una serie di metodi: **Ridistribuzione del carico:** Questo coinvolge la ridistribuzione delle masse o dei carichi all'interno della struttura per migliorare l'equilibrio dei carichi. Ad esempio, spostando o ridimensionando gli elementi strutturali per ridurre le sollecitazioni critiche. **Aggiunta di elementi strutturali:** L'aggiunta di nuovi elementi strutturali o supporti può migliorare la distribuzione dei carichi. Ad esempio, l'installazione di travi o pilastri aggiuntivi per ridurre le sollecitazioni su determinate parti della struttura. **Rinforzo dei materiali:** L'uso di materiali più resistenti o l'aggiunta di rinforzi strutturali può migliorare la capacità di carico di una struttura. Ad esempio, l'aggiunta di fibre di carbonio o l'acciaio per rinforzare una struttura di calcestruzzo. **Ridistribuzione delle masse mobili:** Nei casi in cui i carichi mobili, come il traffico veicolare o il carico di neve su un tetto, possono influire sulla struttura, è possibile modificare le rotte o le aree di distribuzione di questi carichi.

APPLICABILITÀ

La modifica della distribuzione dei carichi della struttura è applicabile in una serie di situazioni:
Ristrutturazione edilizia: Può essere utilizzata per migliorare la capacità portante di edifici esistenti o per adattarli a nuovi utilizzi. **Ponti e strutture stradali:** È utile per adattare le strutture esistenti alle esigenze di traffico moderne o per aumentare la capacità di carico. **Strutture industriali:** Per migliorare la distribuzione dei carichi nelle strutture industriali per garantire una produzione sicura ed efficiente.
Restauro e conservazione: È utilizzata per restaurare edifici storici o monumenti per renderli sicuri e stabili senza alterarne l'aspetto estetico.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Migliora la stabilità e la sicurezza delle strutture esistenti. Consente alle strutture esistenti di continuare a svolgere il loro scopo senza la necessità di demolirle e costruirne di nuove. Spesso è più conveniente rispetto alla costruzione di nuove strutture.
Svantaggi/Rischi: La modifica della distribuzione dei carichi può essere complessa e richiedere calcoli e progettazione accurati. In alcune situazioni, ci possono essere limiti alla modifica delle strutture esistenti a causa delle dimensioni o delle condizioni generali. Una progettazione errata o un'implementazione inadeguata possono comportare rischi strutturali.

SINERGIE E INTERAZIONI

È necessario coordinare la modifica della distribuzione dei carichi con la progettazione strutturale generale per garantire che la struttura rimanga sicura ed efficiente. L'uso di tecnologie di monitoraggio strutturale può aiutare a valutare l'efficacia delle modifiche e a identificare eventuali problemi nel tempo.

NORMATIVA DI RIFERIMENTO

[Eurocodici (EN)] EN 1990 - Basi di calcolo delle strutture, EN 1993 - Progetto delle strutture di acciaio, EN 1994 - Progetto delle strutture in acciaio e calcestruzzo misto

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola, deumidifica, protegge

SPECIFICHE TECNICHE

E' OPPORTUNO VALUTARE CON L'AUSILIO DI UN TEMPO SIA IL QUANTITATIVO DEI NUOVI CARICHI, MA ANCHE LA NUOVA DISPOSIZIONE DEI VANI AL FINE DI RISPETTARE I MQ MINIMI RICHIESTI DA NORMATIVA.

In. 18 SOTTOFONDAZIONE CON MARTINETTI IDRAULICI A PERDERE

PRINCIPIO DI FUNZIONAMENTO

Le sottofondazioni con martinetti idraulici a perdere sono una tecnica utilizzata in ingegneria per sollevare o stabilizzare strutture esistenti, come edifici, ponti o altre infrastrutture, quando si verifica un cedimento o una deformazione indesiderata del terreno sottostante. Il principio di funzionamento è il seguente: **Preliminari e Valutazione:** Prima di iniziare il sollevamento, gli ingegneri effettuano una valutazione approfondita della struttura e delle condizioni del terreno per determinare la causa del problema e la quantità di sollevamento richiesta. **Posizionamento dei Martinetti:** Sotto la struttura, vengono posizionati martinetti idraulici a perdere in punti strategici. Questi saranno utilizzati per applicare una pressione idraulica controllata al terreno sottostante. **Sollevamento Graduale:** Utilizzando una pompa idraulica, la pressione viene gradualmente aumentata nei martinetti. Questo genera una forza verso l'alto che solleva la struttura dal terreno circostante. Il sollevamento è controllato con grande precisione per evitare danni o stress eccessivo alla struttura. **Monitoraggio Continuo:** Durante il processo di sollevamento, la struttura viene monitorata attentamente per rilevare eventuali segni di stress o deformazione e apportare le correzioni necessarie. **Riposizionamento e Consolidamento:** Una volta raggiunta l'altezza desiderata, la struttura viene stabilizzata o consolidata nella nuova posizione.

APPLICABILITÀ

Le sottofondazioni con martinetti idraulici a perdere sono applicabili in diverse situazioni, tra cui:
Quando un edificio subisce un cedimento non uniforme o un'affondamento, i martinetti possono essere utilizzati per riallineare la struttura. Quando le fondazioni di una struttura sono deboli o insufficienti, i martinetti possono essere utilizzati per creare una nuova sottofondazione o per rinforzare quella esistente. Per risolvere problemi di pavimenti fuori livello all'interno di edifici.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Il sollevamento è controllato in modo estremamente preciso, evitando danni aggiuntivi alla struttura. Riduce al minimo l'impatto sulle attività e la vita quotidiana all'interno della struttura. Spesso è più economico rispetto alla demolizione e alla ricostruzione di una struttura.
Svantaggi/Rischi: Richiede competenze specializzate e attrezzature avanzate per essere eseguito correttamente. Se non eseguito correttamente, il sollevamento può causare danni alla struttura. Ci possono essere limiti al livello massimo di sollevamento che può essere ottenuto in modo sicuro.

SINERGIE E INTERAZIONI

La progettazione delle sottofondazioni e dei rinforzi strutturali deve essere eseguita in sinergia con il processo di sollevamento. L'uso di sensori e monitoraggio strutturale continuo è importante per garantire che il processo di sollevamento sia controllato e sicuro. Una valutazione del terreno sottostante è fondamentale per determinare la causa del problema e progettare il sollevamento in modo appropriato.

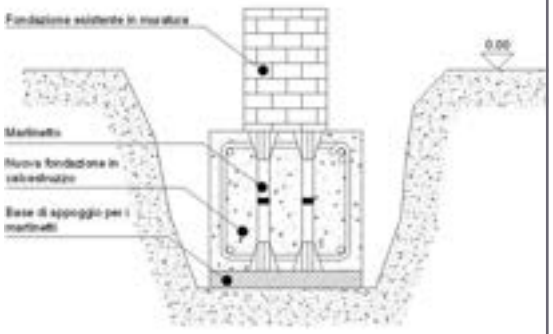
NORMATIVA DI RIFERIMENTO

ASTM E1856 - Standard Guide for Evaluating Computerized Data Acquisition Systems Used to Acquire Data from Mechanical Testing of Buildings and Building Components - ISO 18674-1:2015 - Geotechnical investigation and testing - Geotechnical monitoring by field instrumentation - Part 1: General rules:

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 19 ALLARGAMENTO DELLA BASE DELLA FONDAZIONE

PRINCIPIO DI FUNZIONAMENTO

L'allargamento della base della fondazione è una tecnica che comporta l'aumento dell'area di supporto o della superficie di contatto tra la fondazione di una struttura e il terreno sottostante. Utilizzata per distribuire meglio il carico della struttura sul terreno e ridurre le pressioni al suolo, evitando così il cedimento o il cedimento del terreno. Il principio di funzionamento è il seguente: Prima di iniziare l'allargamento della base, gli ingegneri eseguono un'analisi geotecnica per valutare le caratteristiche del terreno, la capacità portante e la profondità delle fondamenta esistenti. Viene eseguito uno scavo intorno alla base esistente della fondazione, creando uno spazio in cui verrà realizzata l'espansione. La nuova base della fondazione viene realizzata utilizzando materiali come calcestruzzo o una combinazione di calcestruzzo e acciaio. Questa base è progettata per essere più ampia della fondazione originale. La struttura viene sollevata temporaneamente per consentire l'inserimento della nuova base allargata sotto la fondazione esistente. La nuova base allargata viene collegata alla fondazione esistente e consolidata per formare un'unica struttura continua. Il terreno viene ripristinato intorno alla nuova base, e la struttura viene riportata nella sua posizione originale.

APPLICABILITÀ

Quando il terreno sottostante la fondazione non ha una capacità portante sufficiente, l'allargamento della base può distribuire il carico in modo più uniforme e aumentare la stabilità. È utilizzato per migliorare la stabilità e la capacità portante di edifici esistenti quando si verificano problemi di cedimento o inclinazione. Quando è necessario aumentare il carico sostenuto dalla fondazione per adattarsi a un cambio di uso o a una modifica strutturale.

VANTAGGI / SVANTAGGI / RISCHI

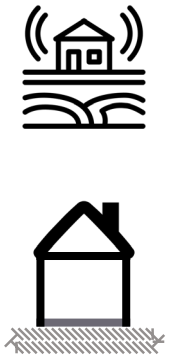
Vantaggi: Migliora la capacità di carico della fondazione esistente, consentendo alla struttura di sopportare carichi più pesanti. Distribuisce il carico in modo più uniforme sul terreno, riducendo il rischio di cedimento o affondamento della struttura.
Riduce al minimo l'interferenza nelle attività e la necessità di sgomberare l'area circostante durante i lavori.
Svantaggi/Rischi: Richiede competenze specializzate e una pianificazione attenta per evitare danni alla struttura esistente. Può essere costoso a causa della necessità di materiali aggiuntivi e del sollevamento temporaneo della struttura. Se non eseguito correttamente, può causare danni alla struttura esistente.

SINERGIE E INTERAZIONI

La progettazione della base allargata deve essere eseguita in sinergia con la struttura esistente per garantire la compatibilità strutturale. Una valutazione accurata del terreno sottostante è fondamentale per determinare la necessità e la dimensione dell'allargamento della base. L'uso di sensori e monitoraggio strutturale continuo è importante per valutare l'efficacia delle modifiche e identificare eventuali problemi nel tempo.

NORMATIVA DI RIFERIMENTO

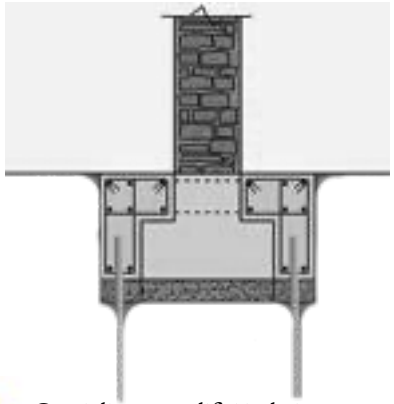
Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer



ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 20 FONDAZIONI SU PALI DI GROSSO E MEDIO DIAMETRO

PRINCIPIO DI FUNZIONAMENTO

Le fondazioni su pali di grosso e medio diametro sono una tecnica di ingegneria civile utilizzata per sostenere edifici e altre strutture sopra terreni inaffidabili o deboli. Il principio di funzionamento è il seguente: Prima di iniziare il lavoro, viene effettuata una sonda geotecnica per valutare le caratteristiche del terreno, la sua capacità portante e la profondità delle strati resistenti. Il sito di costruzione viene preparato per l'installazione dei pali. Questo può includere lo scavo di pozzi o fori nel terreno fino a raggiungere gli strati di terreno più resistenti. I pali, che possono essere in calcestruzzo armato o acciaio, vengono inseriti nei pozzi o fori precedentemente scavati. I pali possono essere perforati o spinti nel terreno fino a raggiungere uno strato di terreno stabile o una roccia sottostante. I pali sono poi collegati alla struttura da sostenere. Questa connessione può avvenire tramite travi, plinti o altri elementi strutturali. La struttura sovrastante trasferisce il carico ai pali, che a loro volta lo distribuiscono al terreno sottostante, sfruttando la capacità portante dello strato stabile o della roccia.

APPLICABILITÀ

Le fondazioni su pali di grosso e medio diametro sono applicabili in diverse situazioni, tra cui:
Sono utilizzate in terreni con capacità portante limitata o instabile, come terreni argillosi, sabbiosi o limosi. Sono adatte per sostenere edifici e strutture con carichi elevati, come grattacieli, ponti, torri e impianti industriali. Possono essere utilizzate per proteggere le strutture da fenomeni come l'abbassamento del livello freatico, l'erosione del terreno o i cambiamenti stagionali del terreno.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Le fondazioni su pali di grosso e medio diametro offrono una capacità portante superiore rispetto ad altre tipologie di fondazioni. Riducono il rischio di cedimenti o movimenti strutturali dovuti alle variazioni delle condizioni del terreno. Possono essere utilizzate in una vasta gamma di situazioni e tipi di terreno.
Svantaggi/Rischi: L'installazione di fondazioni su pali di grosso e medio diametro può essere costosa a causa del materiale e della tecnologia necessari. Richiede competenze specializzate per la progettazione e l'installazione. Gli errori nell'installazione o nella progettazione possono comportare rischi per la sicurezza e danni strutturali.

SINERGIE E INTERAZIONI

La progettazione delle fondazioni su pali deve essere eseguita in sinergia con la progettazione generale della struttura per garantire la compatibilità strutturale.
Una valutazione accurata del terreno sottostante è fondamentale per determinare la profondità e il tipo di pali necessari. L'uso di sensori e monitoraggio strutturale continuo è importante per valutare l'efficacia delle fondazioni e identificare eventuali problemi nel tempo.

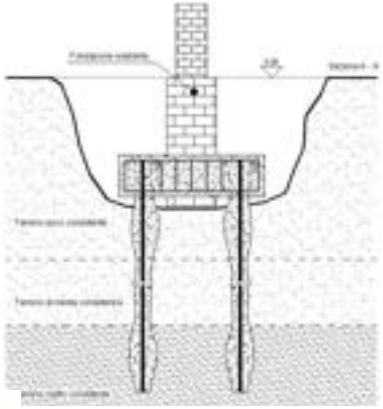
NORMATIVA DI RIFERIMENTO

Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 21 FONDAZIONI SU PALI DI PICCOLO DIAMETRO (MICROPALI)

PRINCIPIO DI FUNZIONAMENTO

Le fondazioni su pali di piccolo diametro, noti come micropali, sono elementi strutturali cilindrici costituiti da materiali resistenti come acciaio o calcestruzzo. Questi pali vengono perforati nel terreno fino a raggiungere uno strato stabile, garantendo così la capacità portante necessaria. Il principio di funzionamento si basa sulla distribuzione del peso dell'edificio sui micropali, consentendo una distribuzione uniforme dei carichi nel terreno sottostante. Questi pali offrono un supporto solido e affidabile per la struttura, evitando l'affondamento o il cedimento.

APPLICABILITÀ

Le fondazioni su micropali sono ampiamente utilizzate in una serie di applicazioni, tra cui:

- Sono ideali per costruzioni su terreni instabili o soggetti a subsidenza.
- Possono essere impiegati in situazioni in cui le fondazioni esistenti sono compromesse o richiedono rinforzo.
- Possono essere utilizzati in situazioni geotecniche complesse, come scogliere, pendii o terreni sabbiosi.

VANTAGGI / SVANTAGGI / RISCHI

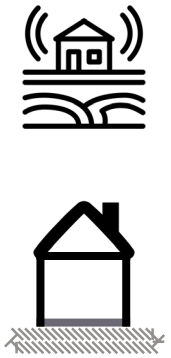
Vantaggi: Efficienza: I micropali richiedono spazi minimi e possono essere installati anche in spazi ristretti o in prossimità di edifici esistenti. Possono sopportare carichi significativi, fornendo stabilità alle strutture. Riducono l'impatto ambientale, limitando la quantità di terreno da scavare. Possono essere utilizzati in una varietà di condizioni geotecniche e ambientali.
Svantaggi/Rischi: L'installazione dei micropali può essere costosa, soprattutto in terreni difficili da perforare. Richiedono competenze specializzate nella progettazione e nell'installazione. Possono richiedere manutenzione nel tempo, specialmente in presenza di corrosione (nel caso di micropali in acciaio).

SINERGIE E INTERAZIONI

I micropali possono essere utilizzati in combinazione con sistemi di isolamento sismico per aumentare la sicurezza sismica degli edifici. La progettazione efficiente delle fondazioni può contribuire a ridurre i consumi energetici dell'edificio. L'uso di materiali ecocompatibili nei micropali può favorire la sostenibilità ambientale.

NORMATIVA DI RIFERIMENTO

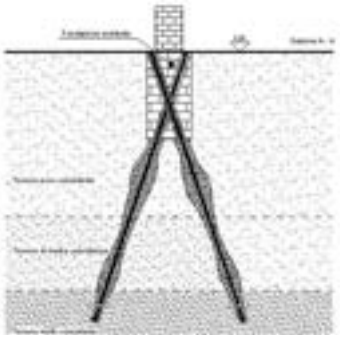
Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer



ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 22 PERFORAZIONI ARMATE

PRINCIPIO DI FUNZIONAMENTO

Le perforazioni armate sono un metodo di rinforzo e consolidamento delle strutture che prevede la realizzazione di fori, solitamente orizzontali, nelle strutture stesse. Questi fori vengono quindi riempiti con armature (spesso barre di acciaio) e calcestruzzo, al fine di incrementare la capacità portante e la stabilità strutturale. Il principio di funzionamento si basa sulla capacità delle armature e del calcestruzzo di lavorare in sinergia per resistere ai carichi e alle tensioni.

APPLICABILITÀ

Le perforazioni armate sono utilizzate in diversi contesti, tra cui:

- Rinforzo strutturale: Per aumentare la capacità portante di elementi strutturali deboli o danneggiati.
- Restauro di edifici storici: Per il consolidamento di fondamenta o elementi portanti senza comprometterne l'aspetto estetico.
- Prevenzione di cedimenti: Per prevenire il collasso o il cedimento di strutture sottoposte a carichi elevati o movimenti del terreno.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Le perforazioni armate possono migliorare notevolmente la capacità portante delle strutture esistenti. Spesso consentono il rinforzo strutturale senza alterare significativamente l'aspetto estetico dell'edificio. In molti casi, rappresentano una soluzione più economica rispetto alla ricostruzione completa di elementi strutturali. L'installazione delle perforazioni è relativamente non invasiva rispetto ad altre tecniche di rinforzo strutturale.
Svantaggi/Rischi: Richiede una progettazione attenta per determinare il posizionamento e le dimensioni delle perforazioni. La corretta esecuzione delle perforazioni e la qualità delle armature e del calcestruzzo sono essenziali per garantire il successo dell'applicazione. È importante selezionare materiali di calcestruzzo e armature compatibili con la struttura esistente.

SINERGIE E INTERAZIONI

Le perforazioni armate possono essere integrate con sistemi di isolamento sismico per migliorare la resistenza sismica delle strutture. L'uso di calcestruzzo eco-compatibile e armature sostenibili può contribuire alla sostenibilità delle strutture. Possono essere applicate soluzioni di efficienza energetica insieme alle perforazioni armate per ridurre i consumi energetici dell'edificio.

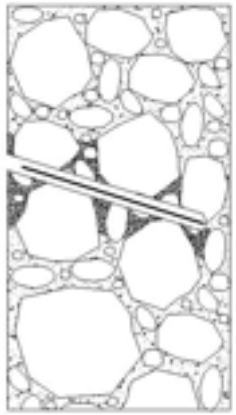
NORMATIVA DI RIFERIMENTO

Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola, deumidifica, protegge

SOLUZIONE CONFORME



In. 23 REALIZZAZIONE DI NUOVE PARETI

PRINCIPIO DI FUNZIONAMENTO

La tecnologia di realizzazione di nuove pareti comporta la creazione di strutture murarie aggiuntive al fine di fornire stabilità e separazione all'interno di un edificio o di un'area. Queste nuove pareti possono essere costruite utilizzando vari materiali come mattoni, calcestruzzo, legno o altri, a seconda delle specifiche esigenze. Il principio di funzionamento si basa sulla capacità delle nuove pareti di distribuire carichi e sforzi strutturali in modo efficace, migliorando la resistenza dell'edificio e fornendo compartimentazione.

APPLICABILITÀ

La realizzazione di nuove pareti è utilizzata in una serie di contesti, tra cui:

Divisione interna degli spazi: Per creare nuovi ambienti o scomparti all'interno di un edificio.
Miglioramento della stabilità strutturale: Per rinforzare edifici deboli o instabili.
Riduzione dell'impatto acustico: Per isolare acusticamente determinate zone all'interno di un edificio.
Suddivisione di locali in ambienti specifici: Per scopi commerciali, residenziali o industriali.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

- Stabilità migliorata: Le nuove pareti contribuiscono al rinforzo strutturale dell'edificio.
- Flessibilità: Consentono la creazione di spazi o ambienti personalizzati in base alle esigenze dell'utente.
- Isolamento acustico: Possono migliorare l'isolamento acustico tra le diverse zone dell'edificio.
- Risparmio energetico: Possono essere integrate con misure di efficienza energetica.

Svantaggi/Rischi:

- Costi: La realizzazione di nuove pareti può comportare costi significativi, tra cui materiali e manodopera.
- Impatto estetico: L'aggiunta di nuove pareti può influenzare l'aspetto estetico dell'edificio.
- Esigenze strutturali: Deve essere valutato attentamente l'effetto delle nuove pareti sulla struttura esistente.

SINERGIE E INTERAZIONI

Le nuove pareti possono essere integrate con sistemi di isolamento sismico per migliorare la resistenza sismica dell'edificio.
L'uso di materiali eco-compatibili e soluzioni di efficienza energetica può contribuire alla sostenibilità delle nuove pareti.

NORMATIVA DI RIFERIMENTO

Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SPECIFICHE TECNICHE

E' OPPORTUNO VALUTARE CON L'AUSILIO DI UN TEMPO LA NUOVA DISPOSIZIONE DEI VANI AL FINE DI RISPETTARE I MQ MINIMI RICHIESTI DA NORMATIVA.

In. 24 TELAI METALLICI CONTROVENTATI

PRINCIPIO DI FUNZIONAMENTO

I telai metallici controventati sono un sistema strutturale che utilizza elementi di acciaio per conferire stabilità e resistenza alle costruzioni. Il principio di funzionamento si basa sulla capacità dei telai metallici di distribuire uniformemente i carichi orizzontali (come quelli provocati da vento o sismi) e trasferirli alle fondazioni. Questi telai agiscono come elementi di controventatura, contribuendo a evitare il cedimento o la deformazione e mantenendo la struttura stabile.

APPLICABILITÀ

I telai metallici controventati sono utilizzati in una serie di contesti, tra cui:

Edilizia: Per il rinforzo di edifici in zone sismiche o esposti a venti intensi.
Edifici alti: Per conferire stabilità alle strutture verticali e impedire il loro oscillamento.
Edifici industriali: Per proteggere dalle forze sismiche e per garantire la sicurezza delle strutture industriali.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

- Stabilità sismica: I telai metallici controventati migliorano la resistenza sismica delle strutture.
- Risparmio di spazio: Occupano meno spazio rispetto ad altri sistemi di rinforzo strutturale.
- Efficienza costruttiva: Sono spesso più veloci da installare rispetto a soluzioni strutturali alternative.
- Durata e manutenzione: Richiedono meno manutenzione a lungo termine rispetto ad altre tecnologie.

Svantaggi/Rischi:

- Costi: L'installazione dei telai metallici può comportare costi significativi, tra cui materiali e manodopera.
- Requisiti di progettazione: Deve essere eseguita un'attenta progettazione per garantire che i telai siano correttamente dimensionati e posizionati.
- Protezione anticorrosione: È importante prevenire la corrosione dei telai metallici, soprattutto in ambienti aggressivi.

SINERGIE E INTERAZIONI

I telai metallici controventati possono essere integrati con sistemi di isolamento sismico per ulteriori livelli di sicurezza.
Possono essere combinati con misure di efficienza energetica per ridurre i consumi energetici degli edifici.
L'uso di acciaio riciclato o ecocompatibile nei telai può contribuire alla sostenibilità delle strutture.

NORMATIVA DI RIFERIMENTO

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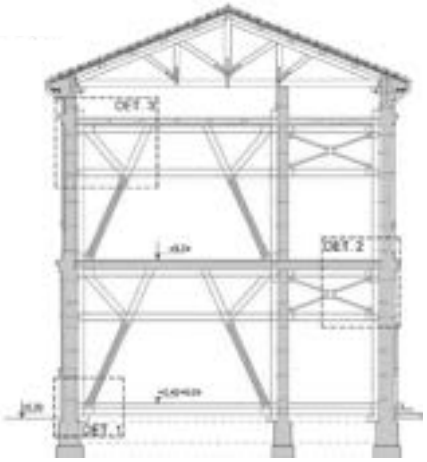
ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 25 CERCHIATURE NELLE APERTURE DI MURATURE PORTANTI

PRINCIPIO DI FUNZIONAMENTO

Le cerchiature nelle aperture di murature portanti sono una tecnologia di rinforzo strutturale che coinvolge l'installazione di elementi orizzontali o verticali (spesso in acciaio) all'interno delle aperture realizzate nelle murature portanti. Il principio di funzionamento si basa sulla capacità delle cerchiature di distribuire uniformemente i carichi orizzontali e verticali lungo la muratura portante, aumentando così la sua capacità di sopportare carichi e resistere alle tensioni. Questa tecnologia è utilizzata per il rinforzo di aperture, come finestre o porte, senza compromettere la stabilità strutturale.

APPLICABILITÀ

Le cerchiature nelle aperture di murature portanti sono utilizzate in vari contesti, tra cui:

Rinforzo di aperture in murature storiche: Per conservare l'aspetto estetico delle murature storiche e al tempo stesso migliorarne la resistenza.
Aperture in edifici esistenti: Per il rinforzo di aperture in murature portanti in edifici già costruiti.
Prevenzione di cedimenti: Per impedire il collasso o la deformazione delle aperture dovuti a carichi o movimenti del terreno.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

- Rinforzo strutturale efficace: Le cerchiature migliorano notevolmente la capacità portante della muratura portante.
- Conservazione estetica: Consentono il rinforzo di aperture in murature storiche senza alterarne significativamente l'aspetto estetico.
- Risparmio di spazio: Occupano meno spazio rispetto a soluzioni alternative come i telai metallici.
- Efficienza costruttiva: Sono spesso più veloci da installare rispetto ad altre tecnologie di rinforzo strutturale.

Svantaggi/Rischi:

- Costi: L'installazione delle cerchiature può comportare costi significativi, tra cui materiali e manodopera.
- Progettazione accurata necessaria: Deve essere eseguita un'attenta progettazione per determinare il posizionamento e le dimensioni delle cerchiature.
- Compatibilità con l'edificio: È importante garantire che le cerchiature siano compatibili con la struttura esistente.

SINERGIE E INTERAZIONI

Le cerchiature possono essere integrate con sistemi di isolamento sismico per ulteriori livelli di sicurezza.
L'uso di materiali eco-compatibili per le cerchiature può contribuire alla sostenibilità delle strutture.
Possono essere combinati con misure di efficienza energetica per ridurre i consumi energetici degli edifici.

NORMATIVA DI RIFERIMENTO

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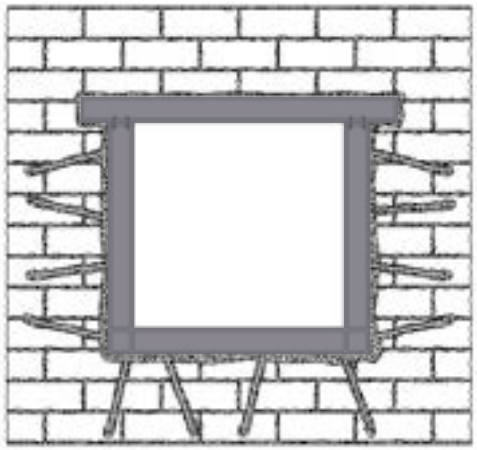
ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 26 RINFORZI CON FRP

PRINCIPIO DI FUNZIONAMENTO

Il rinforzo con FRP, o Fiber Reinforced Polymers, è una tecnologia di rinforzo strutturale che coinvolge l'applicazione di strati di materiali compositi polimerici rinforzati con fibre (come fibra di vetro o fibra di carbonio) sulla superficie di elementi strutturali esistenti, come travi, colonne o pareti. Questi strati di materiali compositi agiscono come rinforzi esterni, aumentando la capacità portante e la resistenza della struttura. Il principio di funzionamento si basa sulla capacità dei materiali compositi a distribuire i carichi e le tensioni, migliorando la resistenza dell'elemento strutturale.

APPLICABILITÀ

Il rinforzo con FRP è utilizzato in vari contesti, tra cui:

Rinforzo di elementi strutturali deboli: Per il miglioramento della capacità portante di travi, colonne o pareti esistenti.
Ristrutturazione di edifici esistenti: Per il consolidamento strutturale di edifici più anziani.
Prevenzione del cedimento: Per impedire il collasso o la deformazione degli elementi strutturali a causa di carichi elevati o movimenti del terreno.
Riparazione di danni strutturali: Per ripristinare l'integrità di elementi strutturali danneggiati.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:
Il rinforzo con FRP può migliorare notevolmente la capacità portante degli elementi strutturali.
I materiali compositi FRP sono leggeri e flessibili, consentendo l'applicazione su una varietà di superfici.
L'installazione dei rinforzi con FRP è relativamente non invasiva rispetto ad altre tecniche di rinforzo strutturale. Spesso rappresenta una soluzione più veloce rispetto alla ricostruzione completa di elementi strutturali.

Svantaggi/Rischi:
L'installazione di rinforzi con FRP può comportare costi significativi, soprattutto in progetti di grandi dimensioni. Richiede una progettazione precisa per determinare la quantità e la disposizione dei rinforzi.
La durata dei materiali compositi FRP può variare in base alle condizioni ambientali e all'esposizione agli agenti esterni.

SINERGIE E INTERAZIONI

Il rinforzo con FRP può essere integrato con sistemi di isolamento sismico per migliorare la resistenza sismica degli edifici. L'uso di materiali compositi FRP ecocompatibili può contribuire alla sostenibilità delle strutture. Possono essere applicate soluzioni di efficienza energetica insieme ai rinforzi con FRP per ridurre i consumi energetici degli edifici.

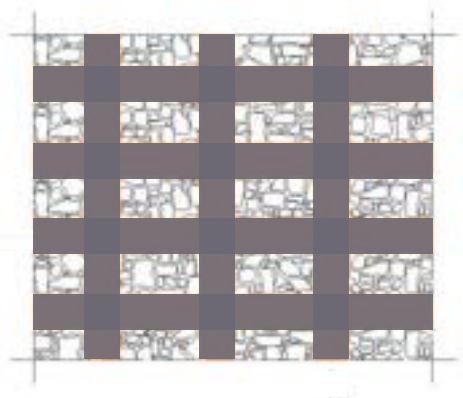
NORMATIVA DI RIFERIMENTO

Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola, deumidifica, protegge

SOLUZIONE CONFORME



In. 27 RISTILATURA DEI GIUNTI

PRINCIPIO DI FUNZIONAMENTO

La ristilatura dei giunti è una tecnica di manutenzione e restauro utilizzata per riparare, sigillare o decorare le giunture tra le superfici di materiali da costruzione come calcestruzzo, mattoni o piastrelle. Questa tecnologia si basa sull'applicazione di un nuovo materiale, solitamente un sigillante o una malta, nelle fessure o nei giunti esistenti per migliorarne l'aspetto, la funzionalità e la resistenza. Il principio di funzionamento prevede che il nuovo materiale si lega alle superfici circostanti, fornendo un'adeguata sigillatura e migliorando l'estetica.

APPLICABILITÀ

La ristilatura dei giunti è utilizzata in vari contesti, tra cui:

Restauro edilizio: Per migliorare l'aspetto estetico e la durabilità delle superfici.
Sigillatura e impermeabilizzazione: Per impedire l'infiltrazione d'acqua o di agenti atmosferici attraverso le giunture.
Decorazione e design: Per creare dettagli estetici o disegni particolari nelle superfici.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:
Miglioramento estetico: La ristilatura può migliorare notevolmente l'aspetto delle superfici, nascondendo fessure o imperfezioni.
Sigillatura: È efficace per prevenire infiltrazioni d'acqua o di agenti atmosferici, contribuendo alla durabilità delle superfici.
Decorazione: Consente di creare dettagli estetici o disegni personalizzati.

Svantaggi/Rischi:
Qualità dell'esecuzione: La corretta applicazione è essenziale per ottenere risultati soddisfacenti.
Durata del materiale: La durata del sigillante o della malta può variare in base alle condizioni ambientali e all'esposizione agli agenti esterni.
Compatibilità dei materiali: È importante selezionare materiali compatibili con le superfici da trattare.

SINERGIE E INTERAZIONI

Possono essere applicate soluzioni di efficienza energetica insieme alla ristilatura dei giunti per ridurre i consumi energetici degli edifici.
L'uso di sigillanti o malte eco-compatibili può contribuire alla sostenibilità delle superfici.

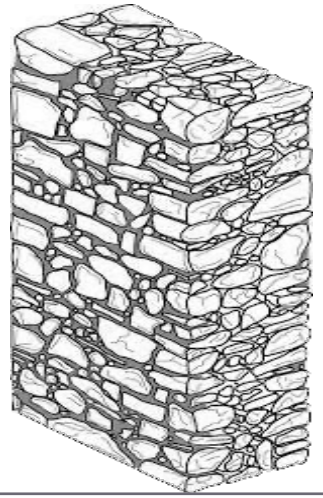
NORMATIVA DI RIFERIMENTO

Eurocodici (EN): EN 1990 - Basi di calcolo delle strutture - EN 1997 - Progettazione geotecnica - ASTM D3385 - Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 28 RINFORZI CON ARCHITRAVI

PRINCIPIO DI FUNZIONAMENTO

I rinforzi con architravi sono una tecnologia di rinforzo strutturale che coinvolge l'aggiunta di elementi orizzontali (gli architravi) sopra le aperture, come porte o finestre, in pareti o murature portanti. Questi architravi vengono fissati alle pareti con lo scopo di distribuire uniformemente i carichi orizzontali e verticali, migliorando la capacità portante e la stabilità della struttura. Il principio di funzionamento si basa sulla capacità degli architravi di distribuire i carichi sui punti d'appoggio, evitando così la deformazione o il cedimento delle aperture.

APPLICABILITÀ

I rinforzi con architravi sono utilizzati in vari contesti, tra cui:

- Edilizia: Per il rinforzo di pareti o murature portanti, spesso in edifici esposti a carichi elevati o a movimenti del terreno.
- Ristrutturazione di edifici esistenti: Per il consolidamento strutturale di edifici più anziani.
- Prevenzione del cedimento: Per impedire il collasso o la deformazione delle aperture dovuti a carichi elevati.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

Rinforzo significativo: I rinforzi con architravi possono migliorare notevolmente la capacità portante della parete o della muratura portante.
Conservazione estetica: Consentono il rinforzo strutturale senza alterarne significativamente l'aspetto estetico.
Risparmio energetico: Possono essere integrate con misure di efficienza energetica.

Svantaggi/Rischi:

Costi: L'installazione dei rinforzi con architravi può comportare costi significativi, tra cui materiali e manodopera.
Progettazione accurata necessaria: Richiede una progettazione precisa per determinare il posizionamento, le dimensioni e i punti d'appoggio degli architravi.
Compatibilità con l'edificio: È importante garantire che gli architravi siano compatibili con la struttura esistente.

SINERGIE E INTERAZIONI

Isolamento sismico: I rinforzi con architravi possono essere integrati con sistemi di isolamento sismico per migliorare la resistenza sismica degli edifici.
Sostenibilità: L'uso di materiali eco-compatibili per gli architravi può contribuire alla sostenibilità delle strutture.
Efficienza energetica: Possono essere combinati con misure di efficienza energetica per ridurre i consumi energetici degli edifici.

NORMATIVA DI RIFERIMENTO

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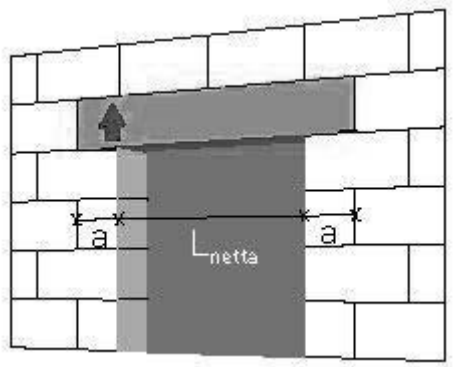
ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



In. 29 CONSOLIDAMENTO DI STRUTTURE ORIZZONTALI

PRINCIPIO DI FUNZIONAMENTO

Il consolidamento di strutture orizzontali è una tecnologia di rinforzo strutturale che mira a migliorare la stabilità e la resistenza delle strutture orizzontali, come solai e pavimenti, attraverso l'aggiunta di elementi o materiali strutturali. Questa tecnologia si basa sulla capacità di ridistribuire i carichi e le tensioni attraverso il rinforzo, prevenendo deformazioni o cedimenti. Il principio di funzionamento comporta l'installazione di elementi aggiuntivi, spesso travi o architravi, sotto i solai esistenti al fine di distribuire uniformemente i carichi e migliorare la capacità portante.

APPLICABILITÀ

Il consolidamento di strutture orizzontali è utilizzato in vari contesti, tra cui:

- **Edilizia:** Per il rinforzo di solai e pavimenti in edifici esistenti.
- **Restauro/Recupero di edifici storici:** Per conservare l'aspetto estetico dei solai o dei pavimenti e migliorarne la resistenza.
- **Edifici industriali:** Per proteggere le strutture orizzontali da carichi pesanti o vibrazioni.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

Rinforzo significativo: Il consolidamento di strutture orizzontali può migliorare notevolmente la capacità portante dei solai e dei pavimenti.
Conservazione estetica: Spesso consente il rinforzo senza alterare significativamente l'aspetto estetico delle superfici.
Risparmio energetico: Possono essere integrate con misure di efficienza energetica.

Svantaggi/Rischi:

Costi: L'installazione di elementi strutturali aggiuntivi può comportare costi significativi, tra cui materiali e manodopera.
Progettazione accurata necessaria: Richiede una progettazione precisa per determinare il posizionamento, le dimensioni e la distribuzione degli elementi strutturali aggiuntivi.
Compatibilità con l'edificio: È importante garantire che il consolidamento sia compatibile con la struttura esistente.

SINERGIE E INTERAZIONI

Isolamento sismico: Il consolidamento di strutture orizzontali può essere integrato con sistemi di isolamento sismico per migliorare la resistenza sismica degli edifici.
Sostenibilità: L'uso di materiali eco-compatibili per il consolidamento può contribuire alla sostenibilità delle strutture.
Efficienza energetica: Possono essere combinati con misure di efficienza energetica per ridurre i consumi energetici degli edifici.

NORMATIVA DI RIFERIMENTO

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ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME

In. 30 AGGREGAZIONE DI DUE EDIFICI CONTIGUI

PRINCIPIO DI FUNZIONAMENTO

L'aggregazione di due edifici contigui consiste nell'unire due strutture adiacenti in un unico complesso edilizio. Questo può essere realizzato attraverso diverse metodologie, tra cui:
Ristrutturazione e unione delle strutture esistenti: Le due costruzioni vengono modificate strutturalmente per permettere la loro connessione fisica.
Costruzione di collegamenti: Viene aggiunta una struttura o una serie di strutture che collegano le due edificazioni preesistenti.

APPLICABILITÀ

Questo approccio può essere applicato in varie situazioni, incluse:
Progetti di sviluppo urbano: Per creare complessi residenziali o commerciali più ampi, integrando edifici adiacenti.
Espansione di strutture esistenti: Per ampliare spazi di uffici, negozi o altri tipi di edifici senza dover demolire e ricostruire completamente.
Riqualificazione di aree urbane: Per valorizzare spazi abbandonati o sottoutilizzati, riducendo il consumo di suolo.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:
Massimizzazione dello spazio: Sfruttando le aree contigue, si ottiene un'efficiente utilizzazione dello spazio disponibile.
Risparmio economico: Rispetto alla costruzione ex novo, l'aggregazione di edifici contigui può risultare meno costosa.
Minore impatto ambientale: Si riduce la necessità di demolizione e costruzione, con conseguente minor spreco di risorse.

Svantaggi/Rischi:
Costi: L'installazione dei rinforzi con architravi può comportare costi significativi, tra cui materiali e manodopera.
Progettazione accurata necessaria: Richiede una progettazione precisa per determinare il posizionamento, le dimensioni e i punti d'appoggio degli architravi.
Compatibilità con l'edificio: È importante garantire che gli architravi siano compatibili con la struttura esistente.

SINERGIE E INTERAZIONI

Efficienza energetica: L'aggregazione di due edifici può consentire l'implementazione di sistemi condivisi di riscaldamento, raffreddamento o altre tecnologie per il risparmio energetico.
Flussi di persone e merci: Unendo due strutture, si possono ottimizzare i percorsi di circolazione interna e facilitare lo spostamento delle persone soprattutto, migliorare l'accessibilità degli immobili per utenti con disabilità motoria.

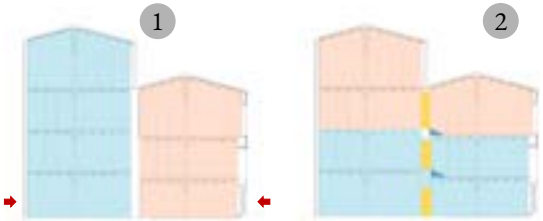
NORMATIVA DI RIFERIMENTO

Legge 20/2005 - D.M. 14/01/2008 - D.P.R. 380/2001

ADEGUAMENTO SISMICO

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SOLUZIONE CONFORME



Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

Nonostante le criticità, l'adeguamento sismico degli edifici rappresenta un investimento imprescindibile per garantire la sicurezza delle persone e preservare il patrimonio edilizio. Con il progresso continuo delle tecnologie innovative e la crescente consapevolezza dei rischi sismici, l'adeguamento sismico assumerà un ruolo sempre più centrale nella gestione del rischio sismico e nella costruzione di un futuro più sicuro.

È inoltre fondamentale che l'adeguamento sismico sia eseguito da professionisti qualificati, capaci di valutare con precisione le caratteristiche dell'edificio e progettare gli interventi più idonei. In contesti più piccoli, dove si conservano le antiche tecniche costruttive, risulta spesso necessario adottare metodi di applicazione tradizionale, rispettando i processi costruttivi del passato e coniugando tradizione e innovazione.

FATTORI TRAINANTI

Maggiore sicurezza per le persone: L'adeguamento sismico degli edifici rende le strutture più resistenti ai terremoti, riducendo il rischio di crolli e salvando vite umane.

Minori danni alle proprietà: Un edificio adeguato sismicamente è in grado di resistere a un terremoto senza subire gravi danni, evitando così ingenti costi di riparazione o ricostruzione.

Protezione del patrimonio culturale: L'adeguamento sismico degli edifici storici e monumentali aiuta a preservarli dai danni sismici, salvaguardando il patrimonio culturale per le generazioni future.

Rilancio economico: L'adeguamento sismico del patrimonio edilizio esistente può generare un effetto positivo sull'economia locale, creando posti di lavoro e stimolando il settore delle costruzioni.

Aumento del valore immobiliare: Un edificio adeguato sismicamente ha un valore di mercato più alto rispetto a un edificio non adeguato, in quanto offre maggiore sicurezza e tranquillità agli acquirenti.

Maggiore resilienza delle comunità: L'adeguamento sismico degli edifici rende le comunità più resilienti ai terremoti, riducendo l'impatto sociale ed economico di questi eventi.

PUNTI CRITICI

Costi elevati: L'adeguamento sismico di un edificio può essere un intervento costoso, soprattutto per edifici complessi o di grandi dimensioni.

Difficoltà tecniche: L'adeguamento sismico può richiedere interventi invasivi sulla struttura dell'edificio, che possono essere complessi da realizzare e possono comportare disagi temporanei agli occupanti.

Mancanza di consapevolezza: Non tutti sono a conoscenza dell'importanza dell'adeguamento sismico e dei rischi sismici a cui sono sottoposti gli edifici.

Barriere normative: In alcuni casi, le normative edilizie o gli standard di finanziamento possono ostacolare l'adeguamento sismico degli edifici.

Mancanza di incentivi: In alcuni casi, non ci sono incentivi sufficienti per incoraggiare i proprietari o gli amministratori di condominio a effettuare interventi di adeguamento sismico.

VALUTAZIONE DEI CRITERI SMART PER IL RECUPERO IDRICO E PROPOSTE DI INTERVENTO

Abbeveratoio; ©Quelli del Parco delle Madonie, 2023

9.1 – LA DIAGNOSI DEL RECUPERO IDRICO

Nel contesto attuale, contraddistinto da una crescente preoccupazione per la gestione responsabile delle risorse naturali, il recupero idrico emerge come una strategia cruciale per affrontare le sfide associate alla scarsità d'acqua, in particolare nei centri abitati di dimensioni ridotte e negli edifici rurali.

L'implementazione di soluzioni avanzate non solo favorisce la sostenibilità, ma contribuisce anche alla resilienza delle comunità in un mondo in cui le risorse idriche sono sempre più soggette a stress antropico e climatico.

1. **raccolta e utilizzo delle acque piovane:** La raccolta delle acque piovane costituisce una pratica fondamentale per ridurre la dipendenza dalle risorse idriche tradizionali. Oltre alla semplice installazione di sistemi di raccolta sulle superfici degli edifici, è possibile ottimizzare questo processo attraverso la canalizzazione delle acque piovane in serbatoi sotterranei o cisterne, riducendo così le perdite per evaporazione e massimizzando la disponibilità di risorse idriche durante i periodi di siccità.
2. **tecnologie di filtrazione avanzate:** Nei contesti rurali, dove le risorse idriche possono essere limitate e la qualità dell'acqua è frequentemente un problema critico, l'adozione di tecnologie di filtrazione avanzate è essenziale. Sistemi di purificazione basati su membrane, filtri avanzati a carbone attivo e dispositivi di ozonizzazione permettono di ottenere acqua di alta qualità, idonea al consumo umano. Sebbene tali tecnologie possano risultare più sofisticate, rappresentano un investimento a lungo termine nella salute e nel benessere delle comunità rurali.
3. **gestione integrata delle risorse idriche:** La gestione integrata delle risorse idriche considera l'acqua non solo come una risorsa, ma come parte di un sistema interconnesso di ambiente, agricoltura e sviluppo urbano. Approcci che tengono conto delle esigenze delle comunità locali, dell'agricoltura sostenibile e della conservazione degli ecosistemi acquatici sono essenziali. Questo approccio olistico mira a massimizzare i benefici dell'acqua per tutti i settori, promuovendo contemporaneamente la conservazione e il ripristino degli ambienti acquatici.
4. **educazione e partecipazione comunitaria:** L'educazione e la partecipazione della comunità sono elementi fondamentali per il successo delle iniziative di recupero idrico. Programmi educativi locali possono sensibilizzare i residenti sui benefici delle pratiche sostenibili e fornire competenze pratiche per la gestione efficiente delle risorse idriche. Inoltre, il coinvolgimento della comunità nella progettazione e nell'implementazione di soluzioni specifiche può accrescere l'efficacia delle iniziative e garantirne l'adozione a lungo termine.
5. **incentivi e supporto governativo:** Il sostegno governativo è cruciale per incentivare l'adozione di pratiche sostenibili. Incentivi fiscali, sussidi per la ricerca e lo sviluppo di tecnologie idriche avanzate, nonché programmi di finanziamento agevolato possono facilitare l'accesso delle comunità rurali a soluzioni all'avanguardia. Inoltre, politiche di gestione del territorio che promuovono la conservazione delle risorse idriche e la riduzione degli sprechi giocano un ruolo fondamentale.

L'ottimizzazione della gestione idrica nei centri abitati di piccole dimensioni e negli edifici rurali richiede un approccio integrato che consideri le diverse dimensioni del problema.

Attraverso l'adozione di tecnologie avanzate, la partecipazione attiva della comunità e il sostegno governativo, è possibile trasformare le sfide legate all'acqua in opportunità per costruire comunità più resilienti e sostenibili.

Una masseria a Scillato; ©Luisa Lombardo, 2023

9.2 – PROCEDURE PER IL RECUPERO IDRICO

Il recupero idrico nei centri abitati e nelle abitazioni può essere realizzato mediante diverse procedure e tecniche. Di seguito sono illustrate alcune delle pratiche comuni per il recupero e l'utilizzo delle risorse idriche:

Raccolta delle acque piovane
- installazione di sistemi di grondaie: canalizzare le acque piovane dai tetti verso serbatoi o cisterne attraverso grondaie appositamente progettate, al fine di accumulare l'acqua per usi futuri.
- utilizzo di superfici permeabili: impiegare materiali permeabili o pavimentazioni ecologiche che favoriscano l'infiltrazione dell'acqua piovana nel terreno, contribuendo così al recupero e alla gestione delle acque meteoriche.

Serbatoi per il recupero dell'acqua
- installazione di serbatoi di raccolta: collocare serbatoi di raccolta per immagazzinare l'acqua piovana o quella proveniente da altre fonti non potabili, garantendo così una riserva d'acqua disponibile per usi non potabili.
- sistemi di filtrazione: integrare sistemi di filtrazione per rimuovere impurità e sedimenti dalle acque raccolte, assicurando che l'acqua accumulata sia idonea per l'uso previsto.

Trattamento e purificazione
- dispositivi di purificazione: utilizzare dispositivi di purificazione come filtri a carbone attivo, sistemi di osmosi inversa o dispositivi di sterilizzazione solare per rendere potabile l'acqua raccolta, garantendo così la sicurezza dell'acqua per il consumo umano.
- sistemi di clorazione: in alcuni casi, l'aggiunta controllata di cloro può essere impiegata per mantenere l'acqua libera da batteri e microrganismi, assicurando un ulteriore livello di sicurezza.

Utilizzo dell'acqua riciclata
- impiego nell'irrigazione: utilizzare l'acqua recuperata per l'irrigazione di giardini, parchi pubblici o coltivazioni agricole, riducendo la domanda di acqua potabile per tali scopi.
- sistemi di riciclo delle acque grigie: installare sistemi che raccolgono e trattano le acque grigie (provenienti dall'uso domestico, escludendo toilette e cucina) per riutilizzarle per scopi non potabili, come il lavaggio o l'irrigazione.

Educazione e sensibilizzazione
- programmi educativi: implementare programmi educativi per sensibilizzare la comunità sull'importanza del risparmio idrico e delle pratiche di recupero, promuovendo un comportamento consapevole e responsabile riguardo all'uso dell'acqua.
- promozione di abitudini sostenibili: incentivare l'adozione di comportamenti sostenibili, quali la riparazione di perdite idriche e l'uso consapevole dell'acqua, per ridurre il consumo e ottimizzare l'uso delle risorse idriche disponibili.

Normative e incentivi governativi
- normative per l'efficienza idrica: adottare normative che promuovano la sostenibilità idrica nelle nuove costruzioni e negli interventi urbanistici, garantendo che le pratiche di recupero idrico siano integrate nel processo di pianificazione e costruzione.
- incentivi finanziari: offrire incentivi finanziari, agevolazioni fiscali o sussidi per incoraggiare la popolazione a investire in sistemi di recupero idrico, facilitando l'adozione di tecnologie e pratiche avanzate.

Manutenzione periodica
- programmi di manutenzione: stabilire programmi di manutenzione periodica per garantire il corretto funzionamento dei sistemi di raccolta e trattamento dell'acqua, prevenendo guasti e garantendo l'efficienza operativa.
- monitoraggio della qualità: monitorare regolarmente la qualità dell'acqua recuperata per assicurarsi che essa sia idonea all'uso previsto, intervenendo tempestivamente in caso di anomalie.

L'implementazione di queste procedure richiede una combinazione di impegno individuale, supporto comunitario e politiche governative che promuovano la sostenibilità idrica a lungo termine, contribuendo così a una gestione più efficiente e responsabile delle risorse idriche.

Sclafani Bagni; ©Luisa Lombardo, 2023

9.3 - IL CONSUMO D'ACQUA NELLE NOSTRE CASE

Il consumo medio di acqua potabile per una famiglia in Italia si attesta intorno ai 200 metri cubi all'anno; tuttavia, solo una frazione di questa quantità è effettivamente destinata a scopi come il bere e la preparazione dei cibi.

Nelle abitazioni civili, è possibile soddisfare circa il 50% del fabbisogno giornaliero di acqua attraverso il recupero e il riutilizzo delle acque, indirizzandole verso utilizzi come l'irrigazione delle aree verdi, il lavaggio dei veicoli, lo scarico dei WC e la lavanderia.

Attualmente, nel settore immobiliare, si osserva un incremento dei prezzi delle abitazioni classificate in classe energetica A o B. Gli immobili dotati di sistemi che integrano tecnologie avanzate per il risparmio energetico e idrico tendono a mantenere un valore più elevato nel tempo.

L'architettura contemporanea deve tenere in considerazione la sostenibilità degli edifici, e Aliaxis risponde a questa esigenza con soluzioni innovative per il recupero e il riutilizzo delle acque. L'adozione di sistemi di riciclo dell'acqua rappresenta un impegno concreto per la tutela dell'ambiente e offre diversi vantaggi:

- **Edilizia Sostenibile:** Un impianto di recupero e riciclo dell'acqua contribuisce alla classificazione LEED dell'edificio.
- **Risparmio Idrico:** Le soluzioni adottate devono consentire una riduzione fino al 50% del consumo di acqua potabile.
- **Conformità alle Normative:** Tutti i sistemi devono rispettare le normative e i regolamenti vigenti.
- **Incentivi Volumetrici:** Possono essere ottenuti grazie alle misure adottate per un adeguato drenaggio e stoccaggio delle acque piovane.

Il recupero dell'acqua piovana rappresenta una pratica significativa per diverse ragioni.

Si stima che circa il 50% del fabbisogno giornaliero d'acqua nelle abitazioni civili, equivalente a una richiesta procapite giornaliera variabile tra 150 e 200 litri, possa essere soddisfatto mediante il recupero delle acque piovane.

Questo approccio riduce la dipendenza dall'approvvigionamento idrico tradizionale.

Le principali applicazioni delle acque piovane recuperate includono il riempimento delle cassette dei WC, il lavaggio del bucato, l'irrigazione delle aree verdi, e il lavaggio dei veicoli.

È consigliabile mantenere l'approvvigionamento tramite acquedotto per attività quali il riempimento della vasca da bagno, la doccia, il lavaggio delle stoviglie e altri usi strettamente legati all'igiene personale e domestica, come cucinare.

Un ulteriore beneficio del sistema di recupero delle acque piovane è il miglioramento dell'efficienza delle lavatrici.

L'acqua piovana, priva di calcare, previene la formazione di depositi sulle condutture e sulle resistenze elettriche delle macchine di lavaggio, comportando un risparmio energetico. Inoltre, la minor durezza dell'acqua piovana si traduce in un ridotto consumo di detersivi, con un potenziale risparmio fino al 50%.

Questo aspetto sottolinea ulteriormente i benefici del recupero delle acque piovane, non solo in termini di sostenibilità idrica, ma anche di efficienza energetica e di riduzione dei costi associati.

9.4 - RISPARMIO IDRICO VS SICCITÀ

La Sicilia, come molte altre regioni del Mediterraneo, è particolarmente vulnerabile alla siccità, una condizione che sta diventando sempre più frequente e severa a causa dei cambiamenti climatici.

Gli effetti della siccità in Sicilia sono devastanti e impattano negativamente sull'agricoltura, sull'approvvigionamento idrico e sugli ecosistemi locali.

La combinazione di temperature elevate, precipitazioni insufficienti e una gestione inadeguata delle risorse idriche contribuisce a una crisi idrica che minaccia la sicurezza alimentare e l'equilibrio ecologico dell'isola. In tale contesto, l'adozione di tecnologie avanzate per il recupero e il risparmio idrico assume un'importanza cruciale. Tecnologie quali i sensori di umidità del suolo, i sistemi di irrigazione automatizzati e le tecniche di raccolta delle acque piovane possono ottimizzare l'uso delle risorse idriche, ridurre gli sprechi e garantire un approvvigionamento più sostenibile.

In aggiunta, l'implementazione di sistemi avanzati di monitoraggio e previsione, come i modelli meteorologici sofisticati e i sistemi di gestione intelligente delle risorse, può migliorare significativamente la capacità di risposta e adattamento agli eventi di siccità.

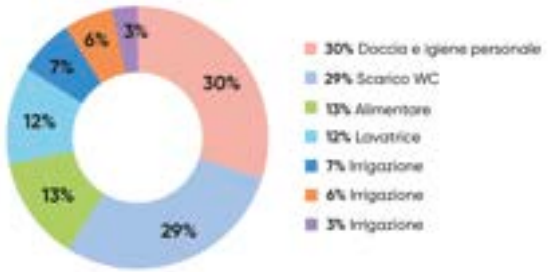


Fig. 1 - Percentuali di utilizzo delle acque riciclate

INDICE DELLE SOLUZIONI INDIVIDUATE

In. 01 - Micro idroelettrico per il trattamento dei reflui
In. 02 - Recupero delle acque grigie
In. 03 - Giardino di pioggia
In. 04 - Canali di drenaggio
In. 05 - Grondaie e serbatoio di accumulo

LEGENDA ICONE

Ambito paesaggistico

Ambito residenziale

Dispositivi a turbina

Canali di drenaggio

Trattamento delle acque

Canali di gronda

Alcune schede tecniche sono corredate di un alert, che segnala la compatibilità dell'intervento con il contesto:
Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.
Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

In. 01 MICRO IDROELETTRICO PER IL TRATTAMENTO DEI REFLUI

PRINCIPIO DI FUNZIONAMENTO

La tecnologia è un sistema all'avanguardia per il trattamento e il riutilizzo delle acque reflue negli edifici, rinomato per la sua efficacia e sostenibilità. Il processo di trattamento si articola in diverse fasi:
Trattamento primario: Le acque reflue domestiche vengono raccolte e pretrattate per rimuovere solidi grossolani e detriti.
Filtrazione a membrana: L'acqua passa attraverso membrane ad alta permeabilità che eliminano batteri, virus e altre impurità.
Disinfezione: L'acqua viene disinfettata mediante raggi UV o ozono per eliminare eventuali microrganismi patogeni residui.
Affinamento opzionale: A seconda delle necessità specifiche, l'acqua può subire ulteriori trattamenti, come l'osmosi inversa o la demineralizzazione, per migliorare ulteriormente la qualità.

APPLICABILITÀ

La tecnologia è versatile e può essere implementata in vari contesti, tra cui: Edifici residenziali,
Edifici commerciali, Scuole, Ospedali, Alberghi, Impianti industriali.
Esempi di implementazione includono l'aeroporto di Changi a Singapore, il Burj Khalifa a Dubai, e il California Academy of Sciences a San Francisco. In Italia, è stata utilizzata in progetti pilota presso l'Università degli Studi di Palermo.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Risparmio idrico: Significativa riduzione del consumo di acqua potabile, riutilizzando le acque reflue per scopi non potabili come: Irrigazione di giardini e aree verdi, Scarico dei sanitari, Lavaggio dei pavimenti, Raffrescamento degli edifici.
Riduzione dell'impatto ambientale: Diminuzione della domanda di acqua potabile, riducendo lo stress sulle risorse idriche locali e minimizzando la produzione di acque reflue da depurare.
Efficienza energetica: Progettato per essere energeticamente efficiente, con bassi consumi durante il funzionamento. **Vantaggi economici:** Significativi risparmi sui costi di gestione dell'acqua negli edifici.
Svantaggi/Rischi:
Costi iniziali: L'installazione del sistema Crutto può comportare costi iniziali elevati.
Manutenzione: Richiede una manutenzione regolare per garantire l'efficienza e la sicurezza del sistema.
Complessità del sistema: La tecnologia avanzata può necessitare di personale specializzato per l'installazione e la gestione.

SINERGIE E INTERAZIONI

La tecnologia può integrarsi con altre soluzioni sostenibili per migliorare la gestione delle risorse idriche e l'efficienza energetica degli edifici. Combinare il trattamento delle acque reflue con la raccolta delle acque piovane per massimizzare il risparmio idrico. Utilizzare energia rinnovabile per alimentare il sistema Crutto, riducendo ulteriormente l'impatto ambientale. Integrare con sistemi di gestione intelligente degli edifici per monitorare e ottimizzare il consumo idrico ed energetico.

NORMATIVA DI RIFERIMENTO

Decreto Legislativo 3 aprile 2006, n. 152, Decreto del Presidente della Repubblica 6 giugno 2001, n. 380, UNI EN 752, UNI EN 12056

DISPOSITIVI PER LA PRODUZIONE DI ENERGIA MICRO IDROELETTRICA

COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B
AZIONI accumula
produce

SPECIFICHE TECNICHE

IL SISTEMA PENSATO, PER LA SUA VERSATILITÀ, PUÒ ESSERE INSERITO ALL'INTERNO DELLE CONDOTTE DEGLI EDIFICI AL FINE DI FACILITARE IL TRATTAMENTO E CONSENTIRE IL RIUTILIZZO DELL'ACQUA IN RICIRCOLO.

In. 02 RECUPERO DELLE ACQUE GRIGIE

PRINCIPIO DI FUNZIONAMENTO

Le tecnologie peer-to-peer (P2P) per il recupero delle acque grigie negli edifici sono vari sistemi progettati per trattare e riutilizzare le acque grigie. Ecco i principali sistemi:
Sistemi di scambio idrico: Le acque grigie prodotte da un edificio vengono pretrattate e poi scambiate con le acque grigie di un altro edificio. Lo scambio avviene in base alle esigenze di ogni edificio e al volume di acque grigie disponibili. Elevata efficienza idrica, basso impatto ambientale, costi di installazione relativamente bassi. Richiede la collaborazione tra edifici vicini, può essere necessario un sistema di controllo e monitoraggio complesso.
Sistemi di riutilizzo locale: Le acque grigie prodotte da un edificio vengono pretrattate e poi riutilizzate all'interno dello stesso edificio per scopi non potabili, come l'irrigazione di giardini e aree verdi, lo scarico dei sanitari e il lavaggio dei pavimenti. Elevata indipendenza idrica, basso impatto ambientale, costi di installazione relativamente bassi. Richiede sufficiente spazio per l'installazione dei sistemi di pretrattamento e stoccaggio, può essere necessario un sistema di controllo e monitoraggio complesso.
Sistemi ibridi: Combinano elementi di entrambi i sistemi P2P descritti sopra. Un edificio potrebbe scambiare le acque grigie con un edificio vicino e allo stesso tempo riutilizzare le proprie acque grigie per scopi non potabili. Massimizzano i benefici di entrambi i sistemi, offrono maggiore flessibilità e adattabilità alle esigenze specifiche. Possono essere più complessi da progettare e implementare rispetto ai sistemi singoli.

APPLICABILITÀ

Le tecnologie P2P per il recupero delle acque grigie sono applicabili in vari contesti, tra cui: Edifici residenziali, Edifici commerciali, Università, Programmi di certificazione edilizia.
Esempi di implementazione includono: **WaterShare:** Un sistema P2P sviluppato in Australia per lo scambio di acque grigie tra edifici residenziali e commerciali. **Greywater Harvesting System:** Un sistema di riutilizzo locale installato presso l'Università della California a Berkeley, utilizzato per l'irrigazione di giardini e il lavaggio dei pavimenti. **Living Building Challenge:** Un programma di certificazione per edifici che richiede l'implementazione di sistemi di recupero delle acque grigie.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Efficienza idrica: Elevata capacità di risparmio idrico riducendo il consumo di acqua potabile.
Impatto ambientale: Riduzione dello stress sulle risorse idriche locali. **Costi:** Relativamente bassi costi di installazione per alcuni sistemi. **Indipendenza:** I sistemi di riutilizzo locale offrono indipendenza idrica agli edifici.
Svantaggi/Rischi: Collaborazione: I sistemi di scambio idrico richiedono collaborazione tra edifici vicini. **Spazio:** I sistemi di riutilizzo locale richiedono spazio sufficiente per l'installazione. **Complessità:** Potrebbe essere necessario un sistema di controllo e monitoraggio complesso. **Progettazione:** I sistemi ibridi possono essere più difficili da progettare e implementare.

SINERGIE E INTERAZIONI

Le tecnologie P2P per il recupero delle acque grigie possono essere integrate con altre soluzioni sostenibili per migliorare ulteriormente la gestione delle risorse idriche e l'efficienza energetica degli edifici.

NORMATIVA DI RIFERIMENTO

Decreto Legislativo 3 aprile 2006, n. 152, Decreto del Presidente della Repubblica 6 giugno 2001, n. 380, UNI EN 752, UNI EN 12056

SISTEMI PER IL TRATTAMENTO DELL'ACQUA

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI isola
deumidifica
protegge

SPECIFICHE TECNICHE

VIENE APPLICATA PER DEPURARE L'ACQUA DI DOCCE, LAVANDINI E LAVATRICI

In. 03 GIARDINO DI PIOGGIA

PRINCIPIO DI FUNZIONAMENTO

I giardini di pioggia, o “rain garden” o “bioretention”, sono aree verdi poco profonde progettate per raccogliere, infiltrare e depurare l’acqua piovana proveniente da superfici impermeabili come tetti, marciapiedi e strade. Il loro funzionamento si articola in diverse fasi:
Raccolta: L’acqua piovana defluisce verso il giardino di pioggia, dove viene raccolta in una depressione poco profonda.
Infiltrazione: L’acqua penetra lentamente nel terreno attraverso strati di materiali diversi, come ghiaia, sabbia e compost.
Depurazione: Durante l’infiltrazione, l’acqua viene filtrata e depurata naturalmente da detriti, inquinanti e nutrienti in eccesso.
Rilascio: L’acqua filtrata e depurata viene gradualmente rilasciata nel terreno circostante o nelle falde acquifere, contribuendo a ricostituire le risorse idriche locali.

APPLICABILITÀ

I giardini di pioggia sono applicabili in diversi contesti e ambienti, inclusi: Contesti residenziali, Contesti commerciali, Contesti industriali, Spazi pubblici.
Esempi di implementazione includono: **Portland, Oregon (USA):** La città ha un programma pluriennale per la realizzazione di giardini di pioggia, con oltre 2.500 giardini installati. **Toronto, Canada:** La città ha adottato una strategia per la gestione delle acque piovane che include la realizzazione di giardini di pioggia su larga scala. **Sydney, Australia:** Diverse municipalità promuovono l’implementazione di giardini di pioggia nelle proprietà private offrendo incentivi e linee guida.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Gestione sostenibile delle acque piovane: Riduzione dell’impatto delle acque di deflusso, prevenzione di inondazioni, erosioni e sovraccarico dei sistemi fognari. **Depurazione naturale dell’acqua:** Miglioramento della qualità dell’acqua filtrando e rimuovendo inquinanti come sedimenti, metalli pesanti, idrocarburi e nutrienti. **Incremento della biodiversità:** Creazione di habitat per una varietà di piante, insetti e piccoli animali, favorendo la biodiversità locale. **Ricarica delle falde acquifere:** Reintegrazione delle riserve idriche sotterranee, preziose per l’approvvigionamento idrico. **Estetica e valorizzazione del paesaggio:** Creazione di aree verdi piacevoli che aumentano il valore estetico di quartieri e città.

Svantaggi/Rischi: Manutenzione: Richiede manutenzione regolare per rimuovere detriti e garantire l’efficacia del sistema. **Spazio:** Necessita di sufficiente spazio per la realizzazione, che può essere limitato in aree densamente urbanizzate. **Progettazione:** Richiede una progettazione accurata per garantire un’adeguata infiltrazione e depurazione dell’acqua. **Normative:** La realizzazione deve conformarsi alle normative locali, che possono variare significativamente.

SINERGIE E INTERAZIONI

Possono integrarsi efficacemente con altre soluzioni sostenibili e di gestione delle risorse idriche per massimizzare il risparmio idrico. Combinare i giardini di pioggia con altre tecniche di paesaggistica sostenibile per creare spazi verdi multifunzionali. Utilizzare l’acqua depurata dai giardini di pioggia per l’irrigazione di altre aree verdi, riducendo il consumo di acqua potabile.

NORMATIVA DI RIFERIMENTO

Decreto Legislativo 3 aprile 2006, n. 152, Decreto del Presidente della Repubblica 6 giugno 2001, n. 380, UNI EN 752, UNI EN 12056

DISPOSITIVI PER LA CAPTAZIONE E IL RECUPERO DELLE ACQUE PIOVANE

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI accumula
recupera
riutilizza

SPECIFICHE TECNICHE

DIMENSIONAMENTO CORRETTO:
DEVE ESSERE PROPORZIONATO ALL’AREA IMPERMEABILE DA CUI RICEVE L’ACQUA, PER GARANTIRE LA GESTIONE EFFICACE DEL VOLUME DI ACQUA PIOVANA PREVISTO.

Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

In. 04 CANALI DI DRENAGGIO

PRINCIPIO DI FUNZIONAMENTO

I canali di drenaggio dell'acqua piovana nei piccoli centri storici sono progettati per gestire in modo efficiente il flusso di acqua derivante dalle precipitazioni, evitando ristagni e allagamenti. Il principio di funzionamento si basa sulla creazione di un sistema di scolo delle acque superficiali, che può includere grondaie, canalette, e canalizzazioni sotterranee. L'acqua raccolta viene quindi convogliata verso punti di smaltimento sicuro, come reti fognarie o corsi d'acqua.

APPLICABILITÀ

I canali di drenaggio dell'acqua piovana sono particolarmente applicabili nei piccoli centri storici dove la topografia e la densità di edifici storici possono rendere difficile il corretto deflusso delle acque piovane. L'installazione di tali sistemi può preservare le caratteristiche storiche del luogo, prevenendo danni da allagamenti e contribuendo al mantenimento della struttura urbana.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

• Prevenzione di Allagamenti: Riduzione del rischio di allagamenti che potrebbero danneggiare edifici e strade.
• Conservazione del Patrimonio: Contribuiscono a preservare l'architettura storica minimizzando il degrado causato dall'acqua.
• Miglioramento della Sicurezza: Riduzione del rischio di scivolamenti e cadute associate a pavimentazioni scivolose durante piogge intense.

Svantaggi / Rischi:

• Estetica: Possono essere considerati antiestetici se non integrati con attenzione nel contesto urbano.
• Manutenzione: Necessità di manutenzione regolare per evitare l'accumulo di detriti che potrebbero ostacolare il corretto flusso dell'acqua.
• Costi: L'installazione di canali di drenaggio può comportare costi iniziali significativi.

SINERGIE E INTERAZIONI

I canali di drenaggio possono interagire positivamente con altri aspetti del contesto urbano:

• Pianificazione Urbana: La progettazione di sistemi di drenaggio può essere integrata con la pianificazione urbana generale per migliorare la qualità della vita e la sicurezza nella comunità.
• Pavimentazione: Possono essere combinati con pavimentazioni permeabili per favorire l'assorbimento dell'acqua nel terreno.
• Progetti di Riqualificazione: Possono essere parte integrante di progetti di riqualificazione urbana che mirano a migliorare l'infrastruttura e la sostenibilità dei centri storici.
• L'implementazione di sistemi di drenaggio richiede una progettazione oculata e la collaborazione tra urbanisti, ingegneri, autorità locali e la comunità per garantire soluzioni efficaci e armoniose con l'ambiente circostante.

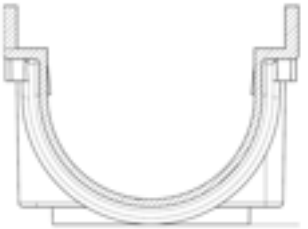
NORMATIVA DI RIFERIMENTO

Decreto Legislativo 3 aprile 2006, n. 152, Decreto del Presidente della Repubblica 6 giugno 2001, n. 380, UNI EN 752, UNI EN 12056

DISPOSITIVO PER LA CAPTAZIONE E IL RECUPERO DELLE ACQUE PIOVANE

COMPATIBILITÀ : A
REVERSIBILITÀ : M - B
INVASIVITÀ : A
AZIONI
raccoglie e allontana l'acqua in superficie
accumula l'acqua piovana
previene l'acqua stagnante

SOLUZIONE CONFORME



Drenaggio estetico per il restauro dell'ingresso monumentale del Duomo di Cefalù

LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica: **B**

Temperature massime medie (°C):
28°C

Venti prevalenti:
N

POSIZIONAMENTO	TESSUTO
CENTRO STORICO	URBANO

TIPOLOGIA DI INTERVENTO:
Restauro e messa in sicurezza del sagrato della Basilica

LOCALIZZAZIONE:
Cefalù, Palermo

PROGETTISTI:
Regione Siciliana

DESTINAZIONE:
Duomo di Cefalù

DATA IMPIANTO ORIGINALE:
1267

ANNO INTERVENTO:
2020

DESCRIZIONE INTERVENTO:
Valorizzare al massimo l'impatto estetico di tutta la piazza davanti l'ingresso del Duomo pur garantendo un efficace ed efficiente sistema di canalizzazioni delle acque meteoriche.

USO	PROMISCUITÀ
PUBBLICO	CENTRO PAESE
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

In. 05 GRONDAIE E SERBATOI DI ACCUMULO

PRINCIPIO DI FUNZIONAMENTO

Grondaie:
Le grondaie sono sistemi di canalizzazione installati sui bordi dei tetti per raccogliere e convogliare l'acqua piovana verso i pluviali (tubi di scarico verticali). Il principio di funzionamento si basa sulla gravità, che fa scorrere l'acqua raccolta lungo la grondaia fino ai pluviali, dai quali viene poi diretta verso un sistema di drenaggio o un serbatoio di accumulo.

Serbatoi di accumulo:
I serbatoi di accumulo sono contenitori utilizzati per immagazzinare l'acqua raccolta dalle grondaie. Possono essere interrati o fuori terra e variano in dimensioni e materiali. Il principio di funzionamento è semplice: l'acqua piovana raccolta dalle grondaie fluisce nei serbatoi attraverso un sistema di tubazioni. L'acqua accumulata può essere utilizzata per vari scopi, come irrigazione, pulizia o anche uso domestico, previa adeguata filtrazione e trattamento.

APPLICABILITÀ

Grondaie: Applicabili a tutti i tipi di edifici con tetti, sia residenziali che commerciali, Essenziali in aree con precipitazioni frequenti per prevenire danni strutturali causati dall'acqua.
Serbatoi di accumulo: Utilizzati in edifici residenziali, commerciali e industriali, Particolarmente utili in aree con scarse risorse idriche o dove è necessario raccogliere e conservare l'acqua piovana per usi futuri, Possono essere integrati in sistemi di gestione delle acque piovane in contesti urbani e rurali.

VANTAGGI / SVANTAGGI / RISCHI

Grondaie - Vantaggi: Prevengono l'erosione del suolo e i danni alle fondamenta degli edifici, Contribuiscono a mantenere asciutte le pareti esterne e le facciate, Facilitano la raccolta dell'acqua piovana.
Svantaggi: Richiedono manutenzione periodica per evitare ostruzioni da foglie e detriti, Possono danneggiarsi o deformarsi nel tempo a causa di agenti atmosferici.
Serbatoi di accumulo - Vantaggi: Permettono di conservare l'acqua piovana, riducendo la dipendenza da fonti idriche esterne, Possono ridurre i costi delle bollette dell'acqua, Contribuiscono alla sostenibilità ambientale.
Svantaggi: Richiedono spazio per l'installazione, Possono necessitare di filtrazione e trattamento per l'uso domestico dell'acqua, I serbatoi fuori terra possono essere esteticamente poco gradevoli.
Rischi: Acqua stagnante nei serbatoi può diventare un focolaio per zanzare e altri insetti, Se non correttamente mantenuti, i serbatoi possono contaminarsi con batteri o altri agenti patogeni.

SINERGIE E INTERAZIONI

Lavorano in sinergia per creare un sistema efficiente di raccolta e gestione dell'acqua piovana, Possono essere integrati per garantire che l'acqua immagazzinata sia pulita e sicura per l'uso, Possono essere collegate ai serbatoi di accumulo per automatizzare l'irrigazione dei giardini e degli spazi verdi, possono utilizzare grondaie e serbatoi per ridurre il rischio di inondazioni e sovraccarico delle reti fognarie.

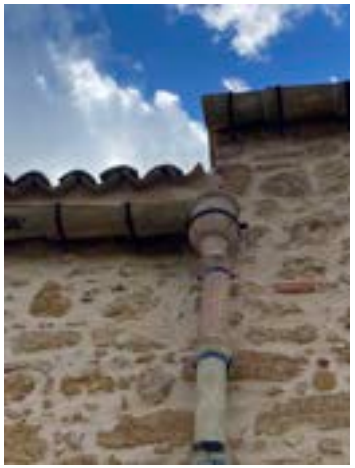
NORMATIVA DI RIFERIMENTO

NTC 2018, Decreto Legislativo 3 aprile 2006, n. 152, UNI 11299-1:2008, Decreto del Presidente della Repubblica 6 giugno 2001, n. 380,

DISPOSITIVI PER LA CAPTAZIONE E IL RECUPERO DELLE ACQUE PIOVANE

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI accumula
recupera
riutilizza

SOLUZIONE CONFORME



MULINI AD ACQUA NEL COMPRENSORIO MADONITA

**Mulino Pucci Calascibetta,
Petralia Sottana**

**Mulino Pitta,
Polizzi Generosa**

**Mulino a Malia,
San Mauro Castelverde**

**Mulino Famunia,
Scillato**

**Mulino Asiniddaru,
Scillato**

**Mulino a Gazzara,
Caltavuturo**

I MULINI DELLE MADONIE

I mulini di Scillato erano distribuiti lungo i due corsi d'acqua noti come torrenti Agnello e Gulfone. Secondo le fonti storiche, i mulini più antichi erano situati lungo il torrente Gulfone, tra cui il mulino Famunia Supranu, considerato il più antico. Nel 1156, la Contessa Adelasia, nipote del Re Ruggero, decise di donare il mulino Famunia Supranu alla Diocesi di Cefalù. Questa donazione rappresentò una nuova fonte di reddito per il clero.

Come gli altri mulini di Scillato, il mulino sfruttava l'energia idraulica, utilizzando l'acqua per generare energia e macinare il grano al fine di produrre farina. La struttura del mulino era articolata in tre componenti principali:

- **il canale di alimentazione:** questo canale convogliava l'acqua verso una caduta improvvisa, simile a una cascata, la cui energia cinetica muoveva la ruota pinnata situata nella parte inferiore;
- **la stanza molitoria:** qui il mugnaio svolgeva le operazioni di macinatura, utilizzando la ruota e altri strumenti per trasformare il grano in farina;
- **la stalla:** in questo spazio venivano alloggiati gli animali da soma, che trasportavano i sacchi di grano al mulino e riposavano prima di riprendere il viaggio con la farina.

Il mulino non era solo un luogo di lavoro, ma anche di socializzazione, caratterizzato da momenti di incontro, scambi affettivi e interazioni tra i membri della comunità.

Anche Collesano, come riportato da Egidio Panzarella nei suoi scritti del 1945, possedeva tre mulini, situati rispettivamente a monte e a valle.

Polizzi Generosa, originariamente ricca di corsi d'acqua del fiume Imera settentrionale, ospitava ben sedici mulini. Essi prendevano nome dai luoghi in cui erano situati, in relazione al territorio, al feudo, alla contrada, all'idrografia, alla storia e alle peculiarità architettoniche.

Tra questi, si ricordano: Nuovo di Susu, Nuovu di Jusu, Supranu, Turri, Granni, Su Spitali, Da Via, Pitta, Puscheria, San Giuseppi, Rocca, Sciumazzu, Canziria, Sciumi Granni, Sacramientu e Piscazzi. Dodici di essi si trovavano a nord, lungo il fiume Vallone Santa Croce. Canziria e Sacramientu erano alimentati dal Rio Secco, mentre Sciumi Granni era servito dal Rio Secco e dal fiume Grandi, e Piscazzi dal Vallone Timpa-Rossa.

Un unico corso d'acqua, chiamato Flomaria Molendinorum nel 1177, è ricordato in particolare per il Mulino Canziria, che nel 1901 fu convertito in una centrale elettrica. La centrale, con una tensione di 1.500V e una linea di 1.700 metri, fu realizzata grazie al progetto di Luigi Rampolla, e illuminava le strade della piccola città.

SCUOLA LEED

Il progetto della nuova scuola a Isnello sarà la prima scuola LEED del Sud Italia, un obiettivo raggiunto grazie alla sua progettazione partecipata e alla sua attenta considerazione delle esigenze della comunità locale. Il Comune di Isnello ha avviato il percorso per la progettazione del nuovo Istituto Comprensivo Luigi Pirandello circa due anni fa. Questo progetto ha coinvolto attivamente la cittadinanza locale, permettendo di integrare i bisogni e le aspirazioni della comunità nel design della scuola. L'edificio si integra perfettamente con il contesto urbano e naturale circostante, nel cuore del Parco delle Madonie. Sarà certificata LEED e sarà alimentato da un impianto fotovoltaico e solare termico per ridurre al minimo il consumo di energia esterna. La gestione delle acque piovane sarà ottimizzata con sistemi di raccolta e riutilizzo, mentre la costruzione stessa sarà gestita per limitare l'impatto ambientale durante il cantiere. All'interno spazi modulari consentiranno una flessibilità nell'uso delle aule, adattandosi alle diverse esigenze didattiche e ricreative. Ci sarà anche uno spazio dedicato alla riflessione e al raccoglimento, oltre a un auditorium per eventi culturali e assemblee. La struttura sarà completamente accessibile, senza barriere architettoniche, e sarà dotata di percorsi e indicazioni apposite per non vedenti e ipovedenti. Particolare attenzione sarà dedicata all'ottimizzazione dell'illuminazione naturale e artificiale, per garantire un ambiente confortevole e sostenibile.

Committente: Comune di Isnello, Direzione Lavori: AM3 Alberto Cusumano, General Contractor: Arceri Costruzioni Vincenzo Arceri, LEED AP Project Administrator: SUMs Architects Giulia Pentella, LEED AP General Contractor : Carola Arrivas Bajardi

Commissioning Authority: TecnoIniziative Gian Paolo Perini

Linee Guida

- **ascolto attivo e consultazione:** Organizzare incontri pubblici e sessioni di ascolto con i residenti locali e i rappresentanti dei comuni vicini per comprendere le loro esigenze, preoccupazioni e suggerimenti relativi al progetto. L'ascolto delle voci della comunità è fondamentale per costruire un consenso e per garantire che il progetto risponda effettivamente ai bisogni locali.
- **trasparenza e comunicazione:** Mantenere la trasparenza riguardo alle decisioni prese e ai processi coinvolti nella progettazione e costruzione della scuola. Utilizzare canali di comunicazione aperti e accessibili per informare regolarmente la comunità sui progressi del progetto, rispondendo alle domande e alle preoccupazioni sollevate.
- **partecipazione attiva:** Offrire opportunità concrete di partecipazione attiva attraverso gruppi di lavoro, comitati consultivi o focus group che coinvolgano i residenti locali, le associazioni culturali, gli imprenditori e altri stakeholder locali. Questo tipo di partecipazione può contribuire a generare idee innovative e a migliorare la qualità complessiva del progetto.
- **educazione e sensibilizzazione:** Organizzare sessioni educative e workshop per informare la comunità sui benefici della sostenibilità ambientale e sui principi dell'edilizia verde. Questo può aumentare l'entusiasmo e l'appoggio per il progetto, incoraggiando una cultura di responsabilità ambientale e sociale.
- **incorporazione della cultura locale:** Valorizzare e integrare elementi della cultura locale e della storia nel design e nelle funzionalità della scuola. Ad esempio, utilizzare materiali e artigianato locali nel processo di costruzione, o creare spazi per esposizioni culturali e attività tradizionali che celebrano l'identità locale.
- **creazione di opportunità economiche:** Esplorare partnership con piccole imprese locali per fornire materiali o servizi per la costruzione della scuola. Questo non solo sostiene l'economia locale, ma crea anche un senso di proprietà e di beneficio tangibile nella comunità.
- **sostenibilità a lungo termine:** Implementare misure per l'utilizzo sostenibile dell'edificio dopo la sua costruzione, come programmi educativi sulla sostenibilità per gli studenti e la comunità, o l'integrazione di pratiche di manutenzione eco-friendly per garantire che l'edificio continui a servire come esempio di buone pratiche ambientali nel tempo.
- **monitoraggio e feedback continuo:** Istallare meccanismi di monitoraggio per valutare l'impatto del progetto sulla comunità e sull'ambiente nel tempo. Raccogliere feedback costanti e apportare eventuali miglioramenti necessari per adattarsi alle esigenze emergenti e migliorare le operazioni.

Benefici del principio di inclusività

L'inclusività in un progetto come la costruzione di una scuola sostenibile a Isnello non è solo una pratica buona, ma un fondamento essenziale per il suo successo e impatto positivo sulla comunità locale. Coinvolgere attivamente i residenti e i comuni circostanti non solo aumenta la legittimità del progetto, ma porta anche benefici significativi sotto diversi aspetti.

In primo luogo, l'inclusività promuove una migliore qualità del progetto stesso. Le diverse prospettive e esperienze portate dalla comunità possono rivelare sfumature importanti che migliorano il design e l'implementazione dell'edificio. Il coinvolgimento delle persone locali può identificare problemi potenziali in anticipo e suggerire modifiche

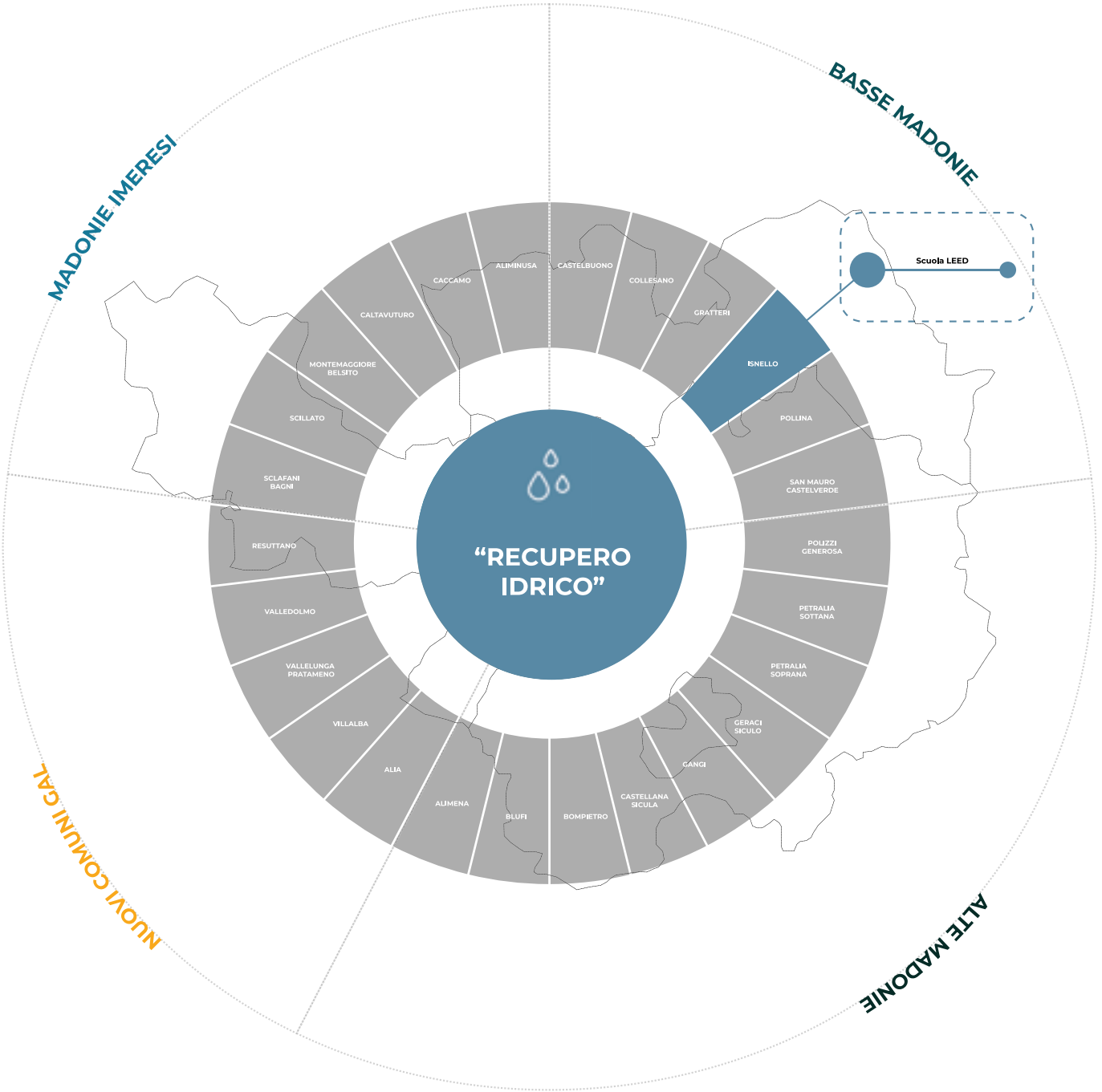
che rendono il progetto più efficace e adattabile alle esigenze reali della zona.

Inoltre, un approccio inclusivo supporta la sostenibilità a lungo termine. Una comunità ben informata e coinvolta è più propensa a sostenere e ad adottare pratiche sostenibili nel tempo. Questo può comprendere comportamenti eco-friendly come la gestione consapevole dei rifiuti o l'uso responsabile delle risorse naturali, che sono in linea con l'intento ambientale della scuola.

L'inclusività crea anche opportunità economiche locali. Collaborazioni e subappalti con imprese del luogo possono stimolare l'economia locale, offrendo benefici economici diretti attraverso il lavoro e indiretti attraverso l'attrattività della zona per residenti e visitatori. Dal punto di vista sociale, un progetto inclusivo rafforza il senso di comunità e la coesione sociale. La collaborazione tra residenti, associazioni locali e autorità pubbliche favorisce un ambiente di fiducia reciproca e supporto, migliorando il benessere generale e la qualità della vita nella zona.

Educazione e consapevolezza sono ulteriori benefici. Coinvolgere la comunità nel progetto aumenta la consapevolezza sulla sostenibilità ambientale e sugli impatti delle scelte quotidiane. Programmi educativi e iniziative della scuola possono diffondere conoscenze che influenzano positivamente le generazioni future, promuovendo comportamenti sostenibili e responsabili.

COMUNI CONVOLTI	
ALTE MADONIE	0/9
BASSE MADONIE	1/6
MADONIE IMERESI	0/6
	1/21
COLLABORAZIONE	1/26
% COMUNI COINVOLTI	**3,84%**



Nonostante le sfide iniziali, il recupero idrico è una soluzione strategica per contrastare la crescente crisi idrica globale. Con l'evoluzione costante delle tecnologie innovative, la riduzione dei costi e una consapevolezza sempre maggiore sull'importanza della sostenibilità, il recupero delle acque diventerà una componente cruciale nella gestione integrata e sostenibile delle risorse idriche.

FATTORI TRAINANTI

Scarsità d'acqua: Con l'aumento della popolazione e dei cambiamenti climatici, la scarsità d'acqua sta diventando un problema sempre più pressante in molte parti del mondo. Il recupero idrico può aiutare ad aumentare la disponibilità di acqua dolce utilizzabile, riducendo la pressione sulle falde acquifere e sui fiumi.

Riduzione dei costi idrici: Il recupero idrico può far risparmiare denaro alle famiglie e alle imprese riducendo la necessità di acquistare acqua potabile o di utilizzare acqua trattata per scopi non potabili.

Protezione dell'ambiente: Il recupero idrico può contribuire a ridurre l'inquinamento idrico diminuendo la quantità di acque reflue che vengono scaricate nell'ambiente. Inoltre, può aiutare a conservare le risorse naturali, come le falde acquifere e i fiumi.

Miglioramento della sicurezza idrica: Il recupero idrico può aumentare la resilienza delle comunità ai periodi di siccità e ad altri eventi climatici estremi diversificando le fonti di approvvigionamento idrico.

Creazione di posti di lavoro: L'industria del recupero idrico sta creando nuovi posti di lavoro in settori come la progettazione, la costruzione e la gestione degli impianti di riutilizzo dell'acqua.

PUNTI CRITICI

Costi iniziali elevati: L'installazione di un sistema di recupero idrico può essere costosa, soprattutto per gli edifici o le imprese di grandi dimensioni.

Complessità tecnica: La progettazione, la costruzione e la gestione di un sistema di recupero idrico possono essere complesse e richiedono competenze specialistiche.

Preoccupazioni per la qualità dell'acqua: L'acqua recuperata deve essere trattata adeguatamente per garantire che sia sicura per l'uso previsto. Se non trattata correttamente, l'acqua recuperata può rappresentare un rischio per la salute pubblica.

Mancanza di norme e regolamenti: In alcuni casi, la mancanza di norme e regolamenti chiari per il recupero idrico può creare incertezza e ostacolare l'adozione di questa tecnologia.

Mancanza di consapevolezza: Non tutti sono a conoscenza dei benefici del recupero idrico e di come implementarlo. Questo può ostacolare l'adozione di questa tecnologia.

VALUTAZIONE DEI CRITERI SMART PER IL MIGLIORAMENTO DELL'ACCESSIBILITÀ E PROPOSTE DI INTERVENTO

Gangi; ©Luisa Lombardo, 2022

10.1 – LA DIAGNOSI DELL'ACCESSIBILITÀ

Nelle città storiche, l'accessibilità per le persone disabili rappresenta spesso una carenza diffusa. Tuttavia, esistono soluzioni pratiche che possono essere implementate per migliorare questa situazione.

Il tema della disabilità è oggetto di ampio studio a livello internazionale, ma in Italia riceve una visibilità inferiore rispetto all'entità del problema. Secondo l'Organizzazione Mondiale della Sanità, circa il 15% della popolazione mondiale vive con una qualche forma di disabilità, una percentuale in continuo aumento. Questo incremento non è attribuibile esclusivamente all'invecchiamento della popolazione, ma anche a malattie croniche, incidenti, conflitti armati, disastri naturali, problemi alimentari e altri fattori.

Le neuroscienze hanno ampliato la definizione di disabilità, includendo disturbi come lo spettro autistico e il disturbo da deficit di attenzione e iperattività tra le disabilità dello sviluppo. Tale categorizzazione ha comportato un aumento significativo dei bambini con disabilità nelle scuole. In Italia, l'ISTAT riporta che circa il 20% della popolazione presenta una forma di limitazione funzionale.

L'accessibilità è cruciale per garantire l'autonomia delle persone con disabilità e impatta numerosi aspetti della vita, tra cui l'istruzione, il lavoro, la salute, lo sport, il turismo e le politiche sociali. L'accessibilità non riguarda esclusivamente l'eliminazione delle barriere architettoniche, ma anche la fruibilità di documenti, siti web, servizi bancari, ascensori, ristoranti e altri luoghi della vita quotidiana.

Le città storiche, sebbene ricche di valore estetico e culturale, presentano frequentemente barriere architettoniche che compromettono l'accessibilità. Questi luoghi storici, che ospitano spesso attività quotidiane, risultano inaccessibili per le persone con disabilità, limitando la loro partecipazione alla vita economica, politica e sociale.

L'importanza della conservazione dei luoghi e degli edifici storici è indiscutibile; tuttavia, esistono norme sia sovranazionali che nazionali che raccomandano la rimozione delle barriere architettoniche. Il problema risiede nella apparente contraddizione tra queste norme. Ad esempio, la Convenzione delle Nazioni Unite del 2006 riconosce il diritto delle persone con disabilità di accedere ai luoghi di valore culturale "per quanto possibile". Sebbene tale principio possa essere applicabile ai luoghi turistici, diventa problematico quando si tratta di uffici pubblici, luoghi di lavoro o scuole, dove l'accessibilità è obbligatoria per legge.

Un caso emblematico è rappresentato dalla città di Trento, dove, nonostante i progressi nella normativa sull'accessibilità, molti edifici storici e il centro cittadino rimangono inaccessibili, con la conservazione che spesso prevale sull'accessibilità.

Problemi specifici riguardano la pavimentazione e i marciapiedi. La pavimentazione a cubetti, comune nelle città storiche, può risultare problematico per le persone con disabilità. Superfici più uniformi sarebbero più sicure per sedie a rotelle e dispositivi di supporto, anche se tale pavimentazione potrebbe essere mantenuta con una manutenzione costante.

Inoltre, i marciapiedi, quando esistono, sono spesso ostruiti da tavoli, sedie, segnaletica e altre strutture, rendendoli difficilmente praticabili. La situazione peggiora ulteriormente alla sera a causa dell'insufficiente illuminazione, che crea ulteriori difficoltà, soprattutto per le persone sorde.

Anche all'interno degli edifici storici si riscontrano problematiche significative, come bagni inaccessibili, scale prive di rampe, mancanza di ascensori e ambienti mal illuminati.

Nonostante l'importanza della conservazione, rendere accessibili i luoghi storici non è impossibile. La mancanza di accessibilità è spesso il risultato di una carenza di volontà politica, poiché le normative sulla conservazione vengono talvolta utilizzate come giustificazione per non apportare modifiche.

È essenziale che i pianificatori urbani, gli architetti e gli amministratori pubblici ricevano una formazione adeguata sulla progettazione senza barriere e sulle normative relative alla disabilità. Inoltre, la partecipazione delle persone con disabilità nella pianificazione e progettazione è fondamentale, poiché esse sono esperte delle proprie esigenze e del contesto in cui vivono.

Il coinvolgimento attivo delle persone con disabilità nella progettazione e pianificazione contribuisce a rendere i processi più efficaci, migliorando la comprensione delle esigenze specifiche e favorendo la creazione di comunità più inclusive.

10.2 – PROCEDURE PER MIGLIORARE L'ACCESSIBILITÀ

La genesi del quadro normativo italiano riguardante l'accessibilità alle persone con disabilità trova le sue radici nella Legge n. 118 del 1971, intitolata "Norme in favore di mutilati e invalidi civili". In particolare, l'Articolo 27 di questa legge affronta il tema dell'accessibilità e delle barriere architettoniche.

Nel 1978, il regolamento attuativo dell'Articolo 27 del D.P.R. 384/1978, noto come Decreto Roncini, fornì le prime indicazioni relative alle dimensioni necessarie per rendere accessibili gli edifici pubblici, con un focus su percorsi pedonali, parcheggi, accessi agli edifici, rampe e porte.

Nel 1986, il Decreto Ministeriale n. 236 del 14 giugno divenne un punto di riferimento cruciale, stabilendo prescrizioni tecniche per garantire l'accessibilità, la visitabilità e l'adattabilità degli edifici privati e delle residenze pubbliche. Successivamente, il D.P.R. 24 luglio 1996, n. 503, abrogò il Decreto Roncini, mantenendo come riferimento principale il DM 236/1989 anche per le disposizioni riguardanti l'abbattimento delle barriere negli edifici pubblici.

È fondamentale sottolineare che queste normative si applicano a tutti gli edifici di nuova costruzione e a quelli soggetti a ristrutturazione. Per quanto riguarda gli edifici vincolati, è prevista una deroga solo se un intervento potrebbe compromettere gravemente l'edificio stesso; in tali casi, è comunque necessario prevedere strutture provvisorie e rimovibili che garantiscano la libera circolazione.

Nel contesto europeo e italiano, emerge la crescente importanza di garantire pari opportunità e inclusività per le persone con disabilità. La Direttiva 2000/78/CE si occupa della lotta contro la discriminazione nel campo dell'occupazione e del lavoro, mentre la Direttiva 2016/2102/UE si concentra sull'accessibilità dei siti web e delle applicazioni mobili delle istituzioni pubbliche.

A livello nazionale, la Legge 104/1992 tutela i diritti delle persone con disabilità, promuovendo la loro integrazione sociale e lavorativa. Il Decreto Legislativo 4/2004 implementa la Legge 104/1992, stabilendo misure per garantire l'accessibilità in diversi ambiti. La Legge 13/1989 promuove, invece, l'abbattimento delle barriere architettoniche sia in edifici pubblici che privati.

Nel contesto specifico delle Madonie, si evidenziano sfide quali strade strette, mancanza di giovani e la presenza di barriere architettoniche. Tuttavia, tali problematiche possono essere affrontate con strategie adeguate, come la creazione di soluzioni specifiche per le esigenze della popolazione anziana.

Migliorare l'accessibilità dei borghi potrebbe non solo incentivare la dinamicità della zona, ma anche attrarre nuovi turisti con disabilità motorie, permettendo loro di fruire degli spazi dei borghi.

In particolare, l'implementazione di soluzioni innovative per superare le barriere architettoniche potrebbe rendere i borghi delle Madonie più inclusivi e attrattivi per un pubblico più ampio.

La valorizzazione di queste aree come destinazioni ideali per chi ha difficoltà motorie rappresenterebbe un significativo passo avanti verso la creazione di un ambiente più accessibile e accogliente.

Scillato; ©Luisa Lombardo, 2023

Svincolo Trinità; ©Luisa Lombardo, 2023

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In. 02 - Corrimano tattile
In. 03 - Mappa tattile
In. 04 - Ascensore urbano e montascale
In. 05 - Parametri di identità visiva
In. 06 - Utilizzo di QR Code
In. 07 - Segnaletica e totem
In. 08 - Trasformazione di scale in rampe
In. 09 - Sistemi di audio - controllo per l'orientamento
In. 10 - Montascale
In. 11 - Carrozzine elettriche

LEGENDA ICONE

Ambito urbano

Ambito residenziale

Orientamento

Comprensione

Sistemi per il superamento delle altezza

Digitalizzazione

In. 01 SISTEMI LOGES-VET-EVOLUTION

PRINCIPIO DI FUNZIONAMENTO

I sistemi LOGES-VET-EVOLUTION sono una serie di dispositivi tattilo-vocali progettati per migliorare l'accessibilità e l'orientamento delle persone con disabilità visive negli spazi urbani. Il funzionamento di questi sistemi si basa su:

- **Percorsi Tattili:** Pannelli tattili con rilievi specifici che possono essere percepiti al tatto e con i piedi. Questi percorsi guidano l'utente lungo tragitti sicuri.
- **Informazioni Vocali:** Sensori integrati nei pannelli che attivano messaggi vocali pre-registrati o generati in tempo reale per fornire informazioni e indicazioni.
- **Segnaletica Inclusiva:** Indicatori visivi e tattili, spesso in braille, posizionati in punti strategici per fornire ulteriori dettagli su percorsi e destinazioni.
- **Tecnologia RFID:** Tag RFID (Radio-Frequency Identification) incorporati nei pannelli per interagire con dispositivi portatili che decodificano le informazioni e forniscono indicazioni audio.

APPLICABILITÀ

Questi sistemi possono essere applicati in vari contesti per migliorare l'accessibilità e l'inclusività: Infrastrutture Pubbliche: Stazioni ferroviarie, metropolitane, aeroporti. Edifici Pubblici: Ospedali, uffici governativi, scuole. Aree Urbane: Strade, piazze, marciapiedi. Spazi Commerciali: Centri commerciali, supermercati. Eventi e Mostre: Musei, fiere, conferenze.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Fornisce una guida chiara e sicura per le persone con disabilità visive, Combina feedback tattile e vocale per un'esperienza più completa, Permette agli utenti di muoversi in modo più indipendente e sicuro, Può essere integrato in infrastrutture esistenti senza necessità di grandi modifiche strutturali.
Svantaggi: Installazione e manutenzione possono essere costosi, Richiede una manutenzione regolare per garantire che i dispositivi funzionino correttamente, Dipendenza dalla tecnologia, che può guastarsi o richiedere aggiornamenti frequenti, Gli utenti potrebbero aver bisogno di un periodo di adattamento e formazione per utilizzare efficacemente il sistema.
Rischi: Possibilità di danni volontari che ne riducono l'efficacia, Malfunzionamenti tecnici possono causare disagi, Rumori ambientali elevati possono interferire con i messaggi vocali.

SINERGIE E INTERAZIONI

Combinazione con segnali sonori per fornire una guida completa. Utilizzo di tag RFID per fornire informazioni aggiuntive tramite dispositivi portatili. Luci a LED integrate per migliorare la visibilità e il riconoscimento del corrimano anche per le persone ipovedenti. Utilizzo di materiali durevoli e resistenti per ridurre la necessità di manutenzione frequente.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

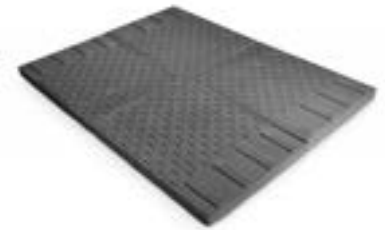
fruizione urbana

COMPATIBILITÀ : B - M
REVERSIBILITÀ : B - M
INVASIVITÀ : M - A
AZIONI guida

COLORI COMPATIBILI

COLORE DELLA PAVIMENTAZIONE SU CUI è INSTALLATO

SOLUZIONE CONFORME



In. 02 CORRIMANO TATTILE

PRINCIPIO DI FUNZIONAMENTO

Il corrimano tattile è una tecnologia progettata per aiutare le persone con disabilità visive a orientarsi e muoversi in sicurezza all'interno degli edifici e nelle aree pubbliche. Funziona attraverso:

- **Superficie Tattile:** Il corrimano è dotato di rilievi, simboli o mappe in braille che forniscono informazioni tattili agli utenti.
- **Sensori e Feedback:** Alcuni corrimani possono essere equipaggiati con sensori che rilevano la presenza dell'utente e attivano segnali acustici o vibrazioni per fornire ulteriori indicazioni.
- **Materiali Contrattili:** Utilizzo di materiali con texture e contrasti tattili distintivi per essere facilmente riconoscibili al tatto.

APPLICABILITÀ

I corrimani tattili possono essere implementati in vari contesti per migliorare l'accessibilità:
Scale e Rampe: Guida e sicurezza per l'orientamento in edifici pubblici e privati.
Stazioni di Trasporto Pubblico: Facilitano l'accesso e la navigazione nelle stazioni ferroviarie, metropolitane e degli autobus.
Centri Commerciali: Aiutano gli utenti a muoversi tra i diversi piani e sezioni.
Ospedali e Strutture Sanitarie: Supporto per i pazienti e visitatori con disabilità visive.
Spazi Pubblici: Aree pedonali e parchi per un'accessibilità universale.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Migliora notevolmente l'orientamento e la mobilità delle persone non vedenti o ipovedenti, Riduce il rischio di cadute e incidenti, Promuove l'inclusione delle persone con disabilità, Richiede una minima formazione per l'uso efficace.
Svantaggi: Installazione e manutenzione possono essere costose, I rilievi e i simboli possono usurarsi nel tempo, richiedendo sostituzioni periodiche, Le informazioni tattili possono essere limitate in quantità e dettaglio rispetto ad altri metodi di comunicazione.
Rischi: Possibilità di danni volontari che ne riducono l'efficacia, Necessità di manutenzione regolare per assicurare che i rilievi rimangano leggibili e intatti, Deve essere compatibile con le normative locali e internazionali per l'accessibilità.

SINERGIE E INTERAZIONI

Combinazione con segnali sonori per fornire una guida completa. Integrazione con mappe tattili posizionate in punti strategici per una migliore comprensione dell'ambiente circostante. Utilizzo di tag RFID per fornire informazioni aggiuntive tramite dispositivi portatili. Luci a LED integrate per migliorare la visibilità e il riconoscimento del corrimano anche per le persone ipovedenti. Utilizzo di materiali durevoli e resistenti per ridurre la necessità di manutenzione frequente.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

fruizione urbana

COMPATIBILITÀ : B - M
REVERSIBILITÀ : B - M
INVASIVITÀ : M - A
AZIONI guida

COLORI COMPATIBILI

COLORE DELLA PARETE SU CUI VIENE INSTALLATO

SOLUZIONE CONFORME

Corrimano per ipovedenti a Napoli

LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica: C

Temperature massime medie (°C):
40°C - 16°C

Venti prevalenti:
SSO

POSIZIONAMENTO	TESSUTO
GRANDE CITTÀ	URBANO

TIPOLOGIA DI INTERVENTO:
Miglioramento accessibilità lungomare per ipovedenti

LOCALIZZAZIONE:
Castel Sant'Elmo, Napoli, Campania

PROGETTISTI:
Paolo Puddu

DESTINAZIONE:
Piazza d'Armi, Golfo di Napoli

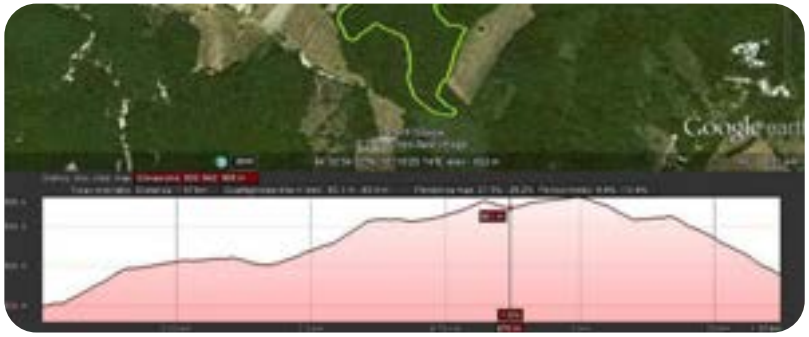
DATA IMPIANTO ORIGINALE:
/

ANNO INTERVENTO:
2020

DESCRIZIONE INTERVENTO:
Creazione di corrimano per ipovedenti e non vedenti, che svela le bellezze di Napoli. L'installazione artistica è ricoperta di scritte in Braile che descrivono la città.

USO	PROMISCUITÀ
PUBBLICO	LUNGOMARE
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

La via per non vedenti “Renzo Saviola”



LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica: **F**

Temperature massime medie (°C):
26°C - (-1°C)

Venti prevalenti:
SSO

POSIZIONAMENTO	TESSUTO
BORGO	PARCO

TIPOLOGIA DI INTERVENTO:
Percorso per ipovedenti

LOCALIZZAZIONE:
Tizzano Val Parma, Emilia Romagna

PROGETTISTI:
Renzo Saviola

DESTINAZIONE:
Azienda Agricola/Agrituristica Casa Nuova

DATA IMPIANTO ORIGINALE:
1993

ANNO INTERVENTO:
1999

DESCRIZIONE INTERVENTO:
La via per non vedenti è un sentiero nel bosco lungo circa 1500 metri, attrezzato per essere percorso in autonomia. Una semplice e piacevole passeggiata che offre l’opportunità di immergersi nella natura incontrando se stessi e gli abitanti del bosco.

USO	PROMISCUITÀ
PUBBLICO	PARCO
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

In. 03 MAPPA TATTILE

PRINCIPIO DI FUNZIONAMENTO

Le mappe tattili sono dispositivi progettati per consentire alle persone con disabilità visive di orientarsi e navigare in spazi interni ed esterni. Il loro funzionamento si basa su:

- **Rilievi Tattili:** Le mappe sono realizzate con rilievi tridimensionali che rappresentano edifici, strade, punti di interesse e altre caratteristiche geografiche.
- **Braille e Testi in Rilievo:** Le informazioni testuali sono riportate in braille o con caratteri in rilievo per essere lette con il tatto.
- **Materiali Contrattili:** Utilizzo di materiali con texture differenti per facilitare la distinzione tra vari elementi della mappa.
- **Tecnologia Interattiva (Opzionale):** Alcune mappe tattili moderne integrano sensori che attivano messaggi vocali o altri feedback quando un'area specifica della mappa viene toccata.

APPLICABILITÀ

Una mappa tattile viene in genere realizzata utilizzando una lastra di materiali tra i più diversi come Le mappe tattili possono essere utilizzate in vari contesti per migliorare l'accessibilità: Edifici Pubblici: Ospedali, scuole, uffici governativi. Trasporti Pubblici: Stazioni ferroviarie, metropolitane, aeroporti. Spazi Urbani: Parchetti, piazze, centri città. Musei e Centri Culturali: Orientamento nelle esposizioni e nei percorsi museali. Centri Commerciali: Guida tra i vari negozi e servizi.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Migliora l'orientamento e la navigazione per le persone con disabilità visive, Promuove l'inclusione e l'indipendenza delle persone con disabilità, Non richiede dispositivi elettronici o tecnologie avanzate, Fornisce una rappresentazione dettagliata dell'ambiente circostante.
Svantaggi: La realizzazione di mappe tattili dettagliate può essere costosa, Le mappe tattili possono occupare spazio significativo, limitando il loro posizionamento, Possono contenere meno informazioni rispetto a mappe digitali o visive dettagliate, Rilievi e testi in braille possono usurarsi nel tempo, richiedendo sostituzioni periodiche.
Rischi: Possibilità di danni volontari che ne riducono l'efficacia, Rischio di deterioramento dei rilievi e delle iscrizioni in braille, In aree molto frequentate, l'accesso alla mappa può essere ostacolato.

SINERGIE E INTERAZIONI

Integrazione di tag RFID per fornire informazioni aggiuntive tramite dispositivi portatili. Sistemi di Combinazione con segnali sonori per migliorare l'orientamento. Interazione con app mobili che forniscono ulteriori dettagli e funzionalità di navigazione. Utilizzo di AI per personalizzare le informazioni fornite e migliorare l'esperienza utente. Utilizzo di colori contrastanti e illuminazione adeguata per facilitare l'uso anche da parte di persone ipovedenti.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

SOLO NEL 30% DELLA SUPERFICIE DELL'INTERA COPERTURA

ESPOSIZIONE NELLA FALDA SUD

In. 04 ASCENSORE URBANO

PRINCIPIO DI FUNZIONAMENTO

L'ascensore urbano nei piccoli centri storici si basa sul principio di fornire un sistema di trasporto verticale per superare dislivelli significativi presenti nelle zone urbane. Questo tipo di ascensore è progettato per integrarsi nell'ambiente storico, rispettando l'architettura circostante. Il funzionamento prevede l'uso di tecnologie sicure ed efficienti per trasportare le persone da un livello all'altro.

APPLICABILITÀ

L'ascensore urbano può essere applicato con successo nei piccoli centri storici per migliorare l'accessibilità e facilitare lo spostamento delle persone, soprattutto in presenza di dislivelli rilevanti come colline o livelli diversi del centro storico. La progettazione dovrebbe mirare a minimizzare l'impatto visivo sull'architettura circostante e a integrare l'ascensore in modo armonioso con il contesto.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:

- Miglioramento dell'accessibilità per residenti e turisti, soprattutto per persone anziane o con difficoltà di movimento.
- Riduzione della fatica legata al superamento di dislivelli significativi a piedi.
- Potenziale incremento del flusso turistico e miglioramento dell'attrattività del centro storico.

Svantaggi / Rischi:

- Possibile impatto visivo sull'architettura storica se il design non è attentamente integrato.
- Costi di installazione e manutenzione possono essere significativi.
- Necessità di considerare aspetti di sicurezza e gestione del flusso di persone.

SINERGIE E INTERAZIONI

L'ascensore urbano può interagire positivamente con l'ambiente circostante e generare sinergie con altre iniziative urbane. Ad esempio:

- Collaborazione con progetti di riqualificazione urbana per migliorare complessivamente l'ambiente del centro storico.
- Integrazione con itinerari turistici e promozione di punti di interesse nelle diverse quote del centro storico.
- Coinvolgimento della comunità locale nel processo decisionale per garantire accettazione e adattamento alle esigenze specifiche del luogo.
- L'implementazione di un ascensore urbano richiede una pianificazione attenta e la collaborazione tra enti locali, urbanisti, architetti e la comunità per massimizzare i benefici e minimizzare gli impatti negativi.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

fruizione urbana

COMPATIBILITÀ : B - M
REVERSIBILITÀ : A
INVASIVITÀ : M - A
AZIONI consente l'accesso ai dislivelli favorisce la mobilità senza alcuna fatica

MATERIALI COMPATIBILI

VETRO

SPECIFICHE TECNICHE

APPLICABILE NON SULLA PUBBLICA VIA, MA NELLE PORZIONI DEL CENTRO POCO VISIBILI E PER MOTIVAZIONI VALIDATE DALLA FRUIZIONE DA PARTE DI DISABILI

Universal design a Villa Massenzio

LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica: D

Temperature massime medie (°C):
14°C - 5°C

Venti prevalenti:
SO - SE

POSIZIONAMENTO	TESSUTO
GRANDE CITTÀ	URBANO

TIPOLOGIA DI INTERVENTO:
Soluzioni per normodotati o con diverse forme di disabilità, visiva ed uditiva, difficoltà di deambulazione, sedia a ruote, anziani.

LOCALIZZAZIONE:
Villa di Massenzio, Roma

PROGETTISTI:
Sovrintendenza Capitolina ai Beni Culturali, Villa di Massenzio

DESTINAZIONE:
Via Appia Antica

DATA IMPIANTO ORIGINALE:
Circa 300 d.C.

ANNO INTERVENTO:
2021

DESCRIZIONE INTERVENTO:
Fruizione del patrimonio culturale e dei servizi turistici, alla realizzazione di plastici, all'impiego di tecnologie di rilievo, alla modellazione e stampa 3D.

USO	PROMISCUITÀ
PUBBLICO	MUSEO
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

Mappe Tattili a Bologna

LOCALIZZAZIONE

DATI CLIMATICI

Zona climatica: **E**

Temperature massime medie (°C):
40,1°C - (-18,8°C)

Venti prevalenti:
SO - E

POSIZIONAMENTO	TESSUTO
GRANDE CITTÀ	URBANO

TIPOLOGIA DI INTERVENTO:
Esplorare il patrimonio artistico della città e migliorare il #turismoaccessibile per le persone non vedenti o ipovedenti.

LOCALIZZAZIONE:
Bologna, Emilia Romagna

PROGETTISTI:
Fondazione Innovazione Urbana, Dipartimento cultura del Comune di Bologna, ProgettoRocK Bologna, l'Istituto dei ciechi Francesco Cavazza.

DESTINAZIONE:
Centro di Bologna

DATA IMPIANTO ORIGINALE:
1993

ANNO INTERVENTO:
1999

DESCRIZIONE INTERVENTO:
Le mappe tattili si integrano con l'esperienza di #AppForAll e con i libri pieghevoli che sono mappe tattili da passeggio.

USO	PROMISCUITÀ
PUBBLICO	CENTRO CITTÀ
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

In. 05 IDENTITA' VISIVA

PRINCIPIO DI FUNZIONAMENTO

L'identità visiva nei sistemi di segnaletica si riferisce alla progettazione e implementazione di cartelli e indicatori che rispettano e si integrano con l'architettura e lo stile visivo locale. I principi di funzionamento includono:
Armonia Estetica: I cartelli e le segnaletiche sono progettati per essere in armonia con l'architettura esistente, utilizzando materiali, colori e stili che riflettono l'ambiente circostante.
Coerenza: Tutti i segnali e i cartelli seguono linee guida di design coerenti per garantire un aspetto uniforme in tutta l'area.
Funzionalità: La segnaletica non solo deve essere estetica, ma anche funzionale, fornendo informazioni chiare e facilmente leggibili.
Materiali Locali: Utilizzo di materiali locali o tradizionali che rispecchiano la storia e la cultura dell'area.

APPLICABILITÀ

L'identità visiva e la segnaletica conforme all'architettura locale sono particolarmente utili in vari contesti: Preservazione dell'estetica storica nelle città e nei villaggi antichi. Creazione di un'esperienza visivamente piacevole e coerente per i turisti. Mantenimento di uno stile uniforme che rispecchia l'architettura delle abitazioni. Coerenza estetica nei vari edifici e spazi aperti. Segnaletica che si integra con l'ambiente naturale.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Crea un ambiente visivamente armonioso e piacevole, Rafforza l'identità culturale e storica del luogo, Migliora l'appeal estetico dell'area, rendendola più attraente per residenti e visitatori, Fornisce indicazioni chiare e coerenti che migliorano la navigazione.
Svantaggi: Progettazione e realizzazione possono essere costose, soprattutto se si utilizzano materiali pregiati o tecniche artigianali, La progettazione e l'installazione possono richiedere tempi lunghi, Difficoltà nel mantenere la coerenza visiva in caso di modifiche o aggiunte future.
Rischi: Rischio di creare un design troppo rigido che potrebbe limitare future innovazioni o adattamenti, Materiali estetici e locali potrebbero richiedere manutenzione frequente per prevenire il degrado, Potenziale difficoltà di adattamento a nuove tecnologie o esigenze se il design è troppo specifico.

SINERGIE E INTERAZIONI

Collaborazione con urbanisti e architetti per assicurare che la segnaletica si integri con i piani di sviluppo urbano. Coinvolgimento della comunità locale per riflettere i valori e l'identità culturale nella segnaletica. Integrazione con soluzioni digitali, come QR code, per fornire informazioni aggiuntive senza compromettere l'estetica. Assicurarsi che la segnaletica sia accessibile a tutti, inclusi anziani e persone con disabilità. Utilizzo di materiali sostenibili e tecniche ecologiche per ridurre l'impatto ambientale.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : M
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

L'IDENTITÀ VISIVA DEVE TENER CONTO ANCHE DEL CONCETTO DI DECORO URBANO, DEVE QUINDI INTEGRARSI CON IL CONTESTO TERRITORIALE AL FINE DI EVITARE QUANTO PIU' POSSIBILE UN IMPATTO TROPPO FORTE SUL PATRIMONIO ARCHITETTONICO PRESENTE

In. 06 UTILIZZO DI QR CODE

PRINCIPIO DI FUNZIONAMENTO

I QR code (Quick Response code) sono codici a barre bidimensionali che possono essere scansionati utilizzando dispositivi come smartphone e tablet dotati di fotocamera. Il loro funzionamento si basa su:

- **Codifica dei Dati:** I QR code possono memorizzare una grande quantità di dati, inclusi URL, testi, numeri di telefono, indirizzi e-mail e altre informazioni. I dati sono codificati in un formato leggibile dalla fotocamera del dispositivo.
- **Scansione:** Utilizzando un'applicazione di lettura QR (spesso integrata nelle app della fotocamera dei moderni smartphone), l'utente può scansionare il QR code.
- **Decodifica e Azione:** Una volta scansionato, l'applicazione decodifica il QR code e avvia l'azione associata, come aprire un sito web, mostrare un messaggio di testo, effettuare una chiamata telefonica, ecc.

APPLICABILITÀ

I QR code sono estremamente versatili e possono essere applicati in una vasta gamma di contesti:
Collegamento a pagine promozionali, sconti e informazioni sui prodotti. Fornitura di informazioni aggiuntive sulle opere esposte. Accesso a orari, mappe e aggiornamenti in tempo reale. Menù digitali, ordini e pagamenti senza contatto. Registrazione e accesso agli eventi tramite biglietti elettronici. Informazioni aggiuntive su edifici storici, attrazioni turistiche e percorsi.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Facilmente scansionabili con dispositivi comuni come smartphone e tablet, Possono memorizzare vari tipi di informazioni e attivare diverse azioni, Generazione e stampa dei QR code sono relativamente economiche, Consentono interazioni senza contatto fisico.
Svantaggi: Richiede l'uso di un dispositivo con fotocamera e connessione internet, Alcuni utenti potrebbero non essere familiari con la tecnologia QR, I QR code possono non essere esteticamente gradevoli e potrebbero deturpare il design di certi materiali stampati o cartelli.
Rischi: I QR code possono essere utilizzati per reindirizzare gli utenti a siti web dannosi o per scaricare malware, Codici di bassa qualità o danneggiati possono essere difficili da scansionare, Potenziale raccolta di dati sugli utenti senza il loro consenso.

SINERGIE E INTERAZIONI

Integrazione con sistemi di pagamento mobile per transazioni rapide e sicure. Collegamento a campagne di marketing digitale, tracciamento dell'interazione degli utenti e analisi dei dati. Attivazione di contenuti AR per un'esperienza interattiva e immersiva. Utilizzo in combinazione con app di navigazione per fornire indicazioni dettagliate e aggiornamenti in tempo reale. Accesso a materiali didattici, quiz interattivi e risorse online tramite QR code.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

fruizione urbana

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI consente l'accesso ai dislivelli favorisce la mobilità senza alcuna fatica

MATERIALI COMPATIBILI

VETRO

SPECIFICHE TECNICHE

APPLICABILE NON SULLA PUBBLICA VIA, MA NELLE PORZIONI DEL CENTRO POCO VISIBILI E PER MOTIVAZIONI VALIDATE DALLA FRUIZIONE DA PARTE DI DISABILI

In. 07 SEGNALETICA e PERCORSI

PRINCIPIO DI FUNZIONAMENTO

La segnaletica e i percorsi sono progettati per guidare, informare e facilitare la mobilità di persone all'interno di vari ambienti. Il loro funzionamento si basa su:

- **Design Visivo e Tattile:** Utilizzo di colori, forme, simboli e testi che siano facilmente riconoscibili e leggibili. In ambienti accessibili, possono includere elementi tattili come rilievi e braille.
- **Posizionamento Strategico:** Cartelli e segnali posizionati in punti chiave e visibili, come ingressi, incroci, scale, ascensori, e uscite di emergenza.
- **Standardizzazione:** Utilizzo di norme e standard per garantire coerenza e comprensibilità universale (es. colori specifici per indicare diverse informazioni).
- **Integrazione Tecnologica:** Incorporazione di tecnologie come QR code, RFID e sensori per fornire informazioni aggiuntive e interattive.

APPLICABILITÀ

La segnaletica e i percorsi sono essenziali in molteplici contesti per garantire un movimento sicuro ed efficiente delle persone: Ospedali, scuole, uffici governativi, biblioteche. Stazioni ferroviarie, metropolitane, aeroporti. Strade, piazze, parchi, marciapiedi. Negozi, parcheggi, punti di informazione.
Musei, teatri, fiere, conferenze.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Aiuta le persone a trovare rapidamente e facilmente la loro destinazione, Riduce il rischio di incidenti fornendo indicazioni chiare sulle vie di evacuazione e le zone di pericolo, Include tutti, comprese persone con disabilità visive o uditive, utilizzando elementi tattili e visivi, Ottimizza il flusso di persone, riducendo il tempo speso a cercare direzioni.
Svantaggi: Progettazione, installazione e manutenzione possono essere costose, specialmente per sistemi complessi, Segnaletica deteriorata può diventare difficile da leggere e inefficace, Cambiamenti nell'infrastruttura richiedono aggiornamenti costanti della segnaletica.
Rischi: Segnaletica poco chiara o contraddittoria può causare confusione e disorientamento, Possibilità di danneggiamento intenzionale che ne riduce l'efficacia, Non conformità agli standard locali o internazionali può risultare in sanzioni o problemi legali.

SINERGIE E INTERAZIONI

Integrazione con app mobili, pannelli digitali e sistemi di navigazione per fornire informazioni in tempo reale. Progettazione inclusiva per garantire l'accessibilità a tutte le persone, indipendentemente dalle loro capacità. Assicurare che la segnaletica sia ben illuminata e visibile anche in condizioni di scarsa illuminazione. Utilizzo di mappe tattili per persone con disabilità visive e QR code per fornire informazioni aggiuntive. Utilizzo di materiali ecologici e pratiche sostenibili nella progettazione e installazione.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : M
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

SOLO NEL 30% DELLA SUPERFICIE DELL'INTERA COPERTURA

ESPOSIZIONE NELLA FALDA SUD

In. 08 TRASFORMAZIONE SCALE IN RAMPE

PRINCIPIO DI FUNZIONAMENTO

La trasformazione di scale in rampe è un processo che coinvolge la conversione o la sostituzione di gradini con una superficie inclinata continua, consentendo l'accesso facilitato a persone con mobilità ridotta, utenti di sedie a rotelle, passeggini e carrelli. I principi chiave includono:

- **Progettazione:** La rampa deve essere progettata considerando l'inclinazione massima consentita, la larghezza adeguata e l'inclusione di corrimano per la sicurezza.
- **Materiali:** Utilizzo di materiali antiscivolo e resistenti per garantire durabilità e sicurezza.
- **Regolamenti e Normative:** Adesione alle normative locali e internazionali per garantire accessibilità e sicurezza.

APPLICABILITÀ

Le rampe possono essere applicate in vari contesti per migliorare l'accessibilità: Ospedali, scuole, uffici governativi, biblioteche, Stazioni ferroviarie, metropolitane, aeroporti, Marciapiedi, parchi, piazze, Negozi, parcheggi, punti di informazione, Condomini, case unifamiliari.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Facilita l'accesso a persone con disabilità motorie, anziani, genitori con passeggini, ecc, Promuove un ambiente inclusivo e accogliente per tutti gli utenti, Aumenta il valore degli edifici e degli spazi pubblici grazie al miglioramento dell'accessibilità, Riduce il rischio di cadute rispetto alle scale, particolarmente in condizioni di bassa visibilità o cattivo tempo.
Svantaggi: Le rampe richiedono più spazio rispetto alle scale per mantenere un'inclinazione sicura, La costruzione o la trasformazione può essere costosa, specialmente se richiede modifiche strutturali significative, Potrebbe essere difficile integrare le rampe senza alterare l'estetica originale dell'edificio o dell'ambiente.
Rischi: Una pendenza troppo ripida può rendere la rampa difficile o pericolosa da utilizzare, L'uso di materiali inadeguati può aumentare il rischio di scivolamenti e cadute, Rampe mal progettate possono presentare ostacoli come bordi, che possono creare difficoltà di utilizzo.

SINERGIE E INTERAZIONI

Installazione di segnaletica chiara per indicare la presenza e la direzione delle rampe. Integrazione con tecnologie come ascensori inclinati o piattaforme elevatrici per superare differenze di altezza maggiori. Applicazione dei principi di design universale per garantire che la rampa sia utilizzabile da tutti, compresi bambini e anziani. Implementazione di un programma di manutenzione per garantire che la rampa rimanga sicura e funzionale nel tempo. Utilizzo di rampe modulari e portatili che possono essere installate temporaneamente o adattate a varie situazioni.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

fruizione urbana

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI

consente l'accesso ai dislivelli
favorisce la mobilità senza alcuna fatica

MATERIALI COMPATIBILI

VETRO

SPECIFICHE TECNICHE

Applicabile non sulla pubblica via, ma nelle porzioni del centro poco visibili e per motivazioni validate dalla fruizione da parte di disabili

Madonie: Cultura Accessibile

LOCALIZZAZIONE

COMUNI ADERENTI AL PROGETTO

Campofelice di Roccella, Castelbuono, Castellana Sicula, Collesano, Geraci Siculo, Petralia Soprana
Petralia Sottana, San Mauro Castelverde, Sclafani Bagni, Valledolmo, Vallelunga Pratameno

Zona climatica: D

POSIZIONAMENTO	TESSUTO
PICCOLI COMUNI	URBANO

TIPOLOGIA DI INTERVENTO:

Il programma "Madonie: Cultura accessibile. Interventi volti a favorire accessibilità ed inclusione nei luoghi della cultura materiale ed immateriale", coinvolge un territorio ampio e diversificato come quello delle Madonie, con l'intento di favorire la creazione di linee guida e best practice in grado di fornire spunti di riflessione agli operatori culturali e agli amministratori per guidarli in tutte le fasi del lavoro. Accesso, partecipazione, inclusione, rappresentazione e sostenibilità sono i cardini su cui è stata costruita l'intera proposta progettuale.

LOCALIZZAZIONE:

Madonie, Sicilia, Italia

PROGETTISTI:

Ministero della Cultura

ANNO INTERVENTO:

2021

DESCRIZIONE INTERVENTO:

"Fondo per la cultura" annualità 2021, art. 184 del D.L. 19 maggio 2020, numero 34, convertito, con modificazioni, dalla legge 17 luglio 2020, numero 77.

USO	PROMISCUITÀ
PUBBLICO	AMBITO URBANO
TIPOLOGIA ANTE	**TIPOLOGIA POST**
PUBBLICO	PUBBLICO

In. 09 SISTEMI TEXT-TO-SPEECH

PRINCIPIO DI FUNZIONAMENTO

La tecnologia Text-to-Speech (TTS) trasforma il testo scritto in linguaggio parlato. Il processo si articola in diverse fasi:

- **Analisi del Testo:** Il testo viene analizzato e suddiviso in frasi e parole.
- **Conversione Fonemica:** Le parole vengono convertite in fonemi, le unità sonore fondamentali della lingua.
- **Sintesi Vocale:** I fonemi vengono combinati e trasformati in onde sonore utilizzando algoritmi di sintesi vocale.

I due principali metodi sono:
Sintesi Concatenativa: Combina registrazioni vocali pre-registrate.
Sintesi Parametrica: Utilizza modelli matematici per generare la voce.

APPLICABILITÀ

I sistemi TTS possono essere integrati in varie infrastrutture urbane per migliorare l'accessibilità, come:
Semafori Pedonali: Forniscono indicazioni vocali per attraversare la strada.
Trasporti Pubblici: Annunci di fermate e avvisi di sicurezza.
Edifici Pubblici: Guide vocali per orientarsi all'interno degli edifici.
Dispositivi per non vedenti: Lettori di testo e guide vocali.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Migliora l'accesso alle informazioni per persone con disabilità visive, Aumenta la sicurezza, ad esempio ai semafori, riducendo il rischio di incidenti, Promuove l'inclusione delle persone con disabilità, Riduce la necessità di assistenza umana costante.
Svantaggi: Le voci sintetiche possono sembrare innaturali o difficili da comprendere, Implementazione e manutenzione possono essere costosi, Dipendenza dalla tecnologia, che può guastarsi o richiedere aggiornamenti frequenti, Potenziali preoccupazioni sulla privacy in spazi pubblici.
Rischi: Il malfunzionamento del sistema potrebbe creare disagi, Rischio di trascurare soluzioni alternative non tecnologiche, Durante i periodi di inattività o manutenzione, le persone dipendenti dai sistemi TTS potrebbero trovarsi svantaggiate.

SINERGIE E INTERAZIONI

Integrazione con sensori e dispositivi intelligenti per aggiornamenti in tempo reale. Utilizzo di AI per migliorare la naturalezza e l'adattabilità delle voci TTS. Sincronizzazione con applicazioni di navigazione per fornire indicazioni vocali precise. Interazione con i sistemi di gestione del traffico per informazioni aggiornate e rilevanti. Integrazione per fornire informazioni tempestive e precise durante situazioni di emergenza.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

fruizione urbana

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI consente l'accesso ai dislivelli favorisce la mobilità senza alcuna fatica

MATERIALI COMPATIBILI

VETRO

SPECIFICHE TECNICHE

APPLICABILE NON SULLA PUBBLICA VIA, MA NELLE PORZIONI DEL CENTRO POCO VISIBILI E PER MOTIVAZIONI VALIDATE DALLA FRUIZIONE DA PARTE DI DISABILI

In. 10 MONTASCALE

PRINCIPIO DI FUNZIONAMENTO

I montascale sono dispositivi meccanici progettati per aiutare le persone con mobilità ridotta a superare le scale. Il loro funzionamento si basa su:

- **Piattaforma o Sedia:** I montascale sono dotati di una piattaforma o una sedia dove l'utente può sedersi o posizionare la propria sedia a rotelle.
- **Binari di Guida:** Installati lungo le scale, i binari guidano il movimento del montascale.
- Motore Elettrico: Alimentato da elettricità, il motore muove la sedia o la piattaforma lungo i binari.
- **Comandi:** Telecomandi o pulsanti posizionati sia sul montascale che nelle vicinanze delle scale per controllare la salita e la discesa.
- **Sicurezza:** Sensori di sicurezza, cinture di sicurezza e sistemi di blocco per prevenire movimenti improvvisi o cadute.

APPLICABILITÀ

I montascale possono essere utilizzati in vari contesti per migliorare l'accessibilità: Case private e condomini. Ospedali, scuole, uffici governativi, biblioteche. Negozi, ristoranti, centri commerciali. Uffici e ambienti di lavoro con più piani.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Permette alle persone con mobilità ridotta di superare le scale autonomamente, Può essere installato in quasi ogni tipo di scala, sia dritte che curve, Equipaggiato con numerosi dispositivi di sicurezza per prevenire incidenti, La maggior parte dei montascale sono progettati per essere confortevoli e facili da usare.

Svantaggi: L'installazione e la manutenzione dei montascale possono essere costose, Richiede spazio sufficiente lungo le scale e può limitare il passaggio di altri utenti, Potrebbe non integrarsi bene con il design e l'estetica dell'edificio.

Rischi: Possibilità di guasti meccanici o elettrici che possono richiedere interventi di manutenzione, Rischio di utilizzo improprio o non autorizzato, specialmente da parte di bambini, Necessità di un piano di evacuazione alternativo in caso di emergenze, come incendi.

SINERGIE E INTERAZIONI

Indicazioni chiare per l'uso del montascale e le sue posizioni. Integrazione con altre soluzioni di accessibilità per un ambiente completamente accessibile. Complemento a rampe, ascensori e altri dispositivi di accessibilità. Pianificazione di controlli e manutenzioni regolari per garantire un funzionamento sicuro e affidabile. Educazione degli utenti e del personale su come utilizzare e mantenere correttamente il montascale.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : M - A
AZIONI

accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

E' POSSIBILE INSERIRLO NEGLI EDIFICI PUBBLICI E LI DOVE NON RECA DISTURBO ALL'ARCHITETTURA TRADIZIONALE, OVVERO, NELLA PARTE RETROSTANTE DELL'EDIFICIO

In. 11 CARROZZINE ELETTRICHE

PRINCIPIO DI FUNZIONAMENTO

Le carrozzine elettriche, note anche come sedie a rotelle elettriche, sono dispositivi motorizzati progettati per facilitare la mobilità delle persone con disabilità fisiche. Il loro funzionamento si basa su:

- **Motori Elettrici:** Dotate di uno o più motori elettrici che alimentano le ruote, permettendo il movimento in avanti, indietro e la rotazione.
- **Batterie Ricaricabili:** Alimentate da batterie ricaricabili che forniscono energia ai motori e ai sistemi elettronici.
- **Controllo Elettronico:** Munite di un joystick o un pannello di controllo che permette all'utente di dirigere il movimento e regolare la velocità.
- **Telaio e Sospensioni:** Progettate per offrire comfort e stabilità su diversi tipi di terreno, con telai robusti e sospensioni che assorbono gli urti.
- **Accessori e Personalizzazioni:** Possono includere accessori e funzioni avanzate come il controllo vocale o il controllo via smartphone.

APPLICABILITÀ

Le carrozzine elettriche sono utilizzate in vari contesti per migliorare l'autonomia e la qualità della vita delle persone con disabilità motorie: Per facilitare la mobilità all'interno della casa. Strade, parchi, centri commerciali, musei. Ospedali, cliniche, centri di riabilitazione. Uffici e ambienti di lavoro con accessibilità. Viaggi, eventi sportivi, attività all'aperto.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Maggiore indipendenza e mobilità senza la necessità di assistenza costante, Progettate per il comfort dell'utente e personalizzabili per soddisfare esigenze specifiche, Facilmente utilizzabili su diverse superfici, comprese pendenze moderate, Inclusione di tecnologie avanzate come il controllo vocale, GPS e connettività Bluetooth.

Svantaggi: Il prezzo delle carrozzine elettriche e della manutenzione può essere elevato, Più pesanti e ingombranti rispetto alle carrozzine manuali, rendendo difficoltoso il trasporto e lo stoccaggio, La necessità di ricaricare regolarmente le batterie e il rischio di esaurimento della carica durante l'uso.

Rischi: Possibilità di malfunzionamenti meccanici o elettronici che possono immobilizzare l'utente, Rischio di utilizzo improprio che può portare a incidenti o danni, Sensibili alle condizioni atmosferiche estreme, come pioggia intensa o neve.

SINERGIE E INTERAZIONI

Interazione con sistemi di domotica per un controllo più facile degli ambienti domestici, Complemento a montascale, rampe e ascensori per migliorare ulteriormente l'accessibilità, Piani regolari di manutenzione per garantire la sicurezza e la funzionalità della carrozzina elettrica.

NORMATIVA DI RIFERIMENTO

Legge Stanca (Legge 4/2004), Direttiva UE 2016/2102 e Decreto Legislativo n. 106/2018, Decreto Semplificazioni (D.L. n. 76/2020)

DISPOSITIVI TECNOLOGICI PER MIGLIORARE L'ACCESSIBILITA'

fruizione urbana

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI consente l'accesso ai dislivelli favorisce la mobilità senza alcuna fatica

MATERIALI COMPATIBILI

VETRO

SPECIFICHE TECNICHE

POICHE' SI TRATTA DI SISTEMI TECNOLOGICI MOBILI E CHE NON DEPURPANO IL CONTESTO, E' SEMPRE POSSIBILE UTILIZZARLE. COSTITUISCONO, AL CONTRARIO, UN SISTEMA EFFICIENTE PER LA MOBILITA' INDIVIDUALE E AUTONOMA.

MADONIE CULTURA ACCESSIBILE

Il progetto "Madonie Cultura Accessibile" mira a migliorare l'accessibilità e l'inclusione nei luoghi della cultura materiale ed immateriale nelle Madonie. Finanziato dal Fondo per la cultura 2021, il progetto è guidato dal Comune di Castellana Sicula e coinvolge un'ampia area che include diversi comuni come Campofelice di Roccella, Castelbuono, Collesano, Geraci Siculo, Petralia Soprana, Petralia Sottana, San Mauro Castelverde, Sclafani Bagni, Valledolmo, e Vallelunga Pratameno.

L'obiettivo principale è sviluppare linee guida e best practice per facilitare l'accesso, la partecipazione, l'inclusione, la rappresentazione e la sostenibilità nei contesti culturali. Questo si traduce in iniziative concrete per rendere i luoghi culturali più accessibili a tutti, inclusi i diversamente abili, promuovendo una cultura dell'inclusione e dell'accessibilità nel territorio delle Madonie.

Linee Guida

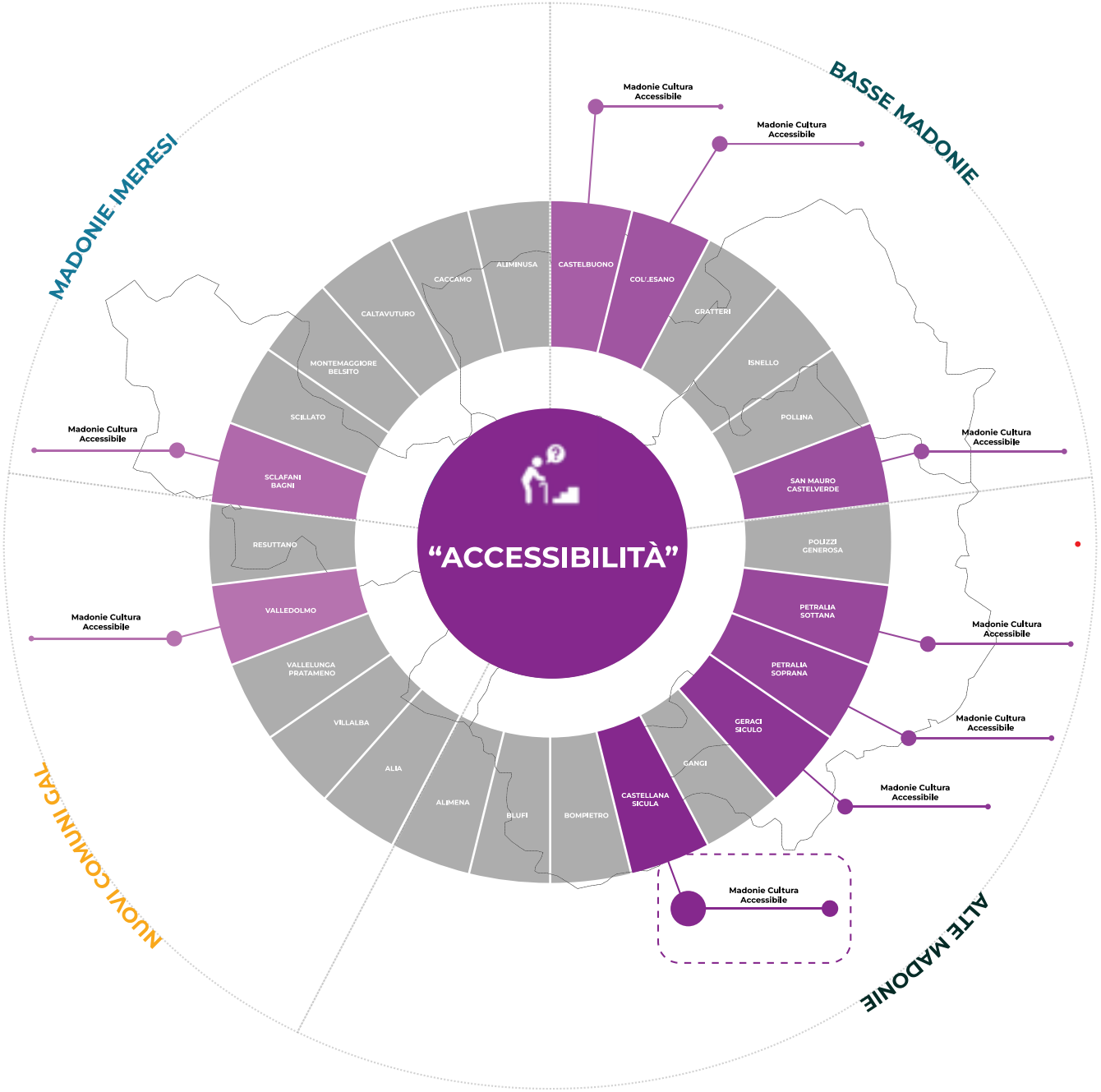
- **consultazioni e incontri regolari:** Organizzare incontri regolari con i rappresentanti dei comuni esclusi per discutere i benefici del progetto, le opportunità di collaborazione e i modi per superare le eventuali barriere.
- **creazione di reti collaborative:** Favorire la creazione di reti collaborative tra i comuni partecipanti e quelli esclusi per condividere esperienze, risorse e competenze. Questo può avvenire attraverso workshop, seminari o gruppi di lavoro tematici.
- **personalizzazione delle soluzioni:** Adattare le iniziative del progetto alle specificità e alle esigenze dei comuni esclusi. Ciò potrebbe significare sviluppare soluzioni flessibili e personalizzate che rispondano alle sfide locali e alle risorse disponibili.
- **promozione dell'inclusione:** Assicurarsi che i comuni esclusi siano pienamente rappresentati e coinvolti nelle decisioni strategiche e nella pianificazione delle attività del progetto. Ciò può aiutare a garantire che le loro prospettive siano integrate nel processo decisionale.
- **formazione e supporto tecnico:** Offrire formazione e supporto tecnico ai comuni esclusi per migliorare le loro capacità di gestione e implementazione delle iniziative culturali accessibili. Questo può includere formazione su normative, buone pratiche e strumenti tecnologici.
- **monitoraggio e valutazione:** Implementare un sistema di monitoraggio e valutazione che includa indicatori specifici per misurare il coinvolgimento e il progresso dei comuni esclusi. Questo aiuta a identificare le aree di miglioramento e a garantire un approccio equo e inclusivo nel progetto.
- **comunicazione chiara e accessibile:** Utilizzare canali di comunicazione chiari e accessibili per informare i comuni esclusi su tutte le fasi del progetto, compresi obiettivi, risultati attesi e opportunità di partecipazione.

Benefici del principio di inclusività

Il principio di inclusività nel contesto del progetto "Madonie Cultura Accessibile" rappresenta un elemento fondamentale per la crescita e lo sviluppo delle comunità locali, generando una serie di benefici significativi sia sul piano sociale che economico. In primo luogo, l'inclusività crea le condizioni per un ambiente in cui ogni individuo, indipendentemente dalle proprie capacità fisiche, condizioni socio-economiche o circostanze personali, possa partecipare attivamente alla vita culturale e sociale. Questo aspetto è cruciale per promuovere l'equità all'interno della comunità, garantendo a tutti i cittadini la possibilità di contribuire e trarre vantaggio dalle iniziative culturali e sociali. In tal modo, si rafforza anche il senso di appartenenza dei singoli individui, che si sentono parte integrante di un tessuto comunitario che li valorizza e li rispetta. Inoltre, l'inclusività porta con sé una diversità di prospettive ed esperienze che arricchisce profondamente il panorama culturale delle Madonie. La partecipazione di persone provenienti da contesti diversi favorisce l'emergere di nuove idee e approcci, stimolando innovazione e creatività nelle iniziative culturali. Questo non solo contribuisce a sviluppare soluzioni più pertinenti e rispondenti alle reali esigenze delle persone, ma aiuta anche a creare un ambiente dinamico e aperto al cambiamento. La cultura diventa così uno strumento di coesione sociale, capace di superare le barriere e le divisioni, e di promuovere un dialogo continuo tra i membri della comunità. Sul piano economico, il principio di inclusività ha un impatto altrettanto rilevante. Garantire un accesso equo ai luoghi e alle attività culturali non solo promuove la giustizia sociale, ma stimola anche il turismo culturale, un settore sempre più importante per lo sviluppo economico locale. Un maggiore afflusso di visitatori, attratti dalla ricchezza e dalla diversità dell'offerta culturale, porta inevitabilmente a un incremento degli investimenti nelle infrastrutture culturali e nelle attività connesse. Questo, a sua volta, può generare nuove opportunità di lavoro, soprattutto nei settori del turismo, dell'artigianato e dei servizi, migliorando la qualità della vita nella regione e contribuendo a una crescita economica sostenibile. Oltre agli aspetti strettamente economici, l'inclusività riveste un ruolo chiave nel rafforzare la coesione sociale all'interno delle comunità. Creare un ambiente in cui tutti si sentono valorizzati e rispettati non solo promuove un senso di appartenenza, ma contribuisce anche al benessere psicologico delle persone. Un contesto inclusivo riduce le disuguaglianze e le tensioni sociali, favorendo relazioni più armoniose e solidali

tra i membri della comunità. Questo senso di comunità più forte e coeso diventa un pilastro fondamentale per la stabilità e la resilienza delle Madonie, permettendo loro di affrontare meglio le sfide del futuro. Rispettare e promuovere l'inclusività nei progetti culturali significa, infine, tutelare i diritti fondamentali di ogni individuo, garantendo un accesso equo non solo all'educazione e alla cultura, ma anche alla partecipazione civica. La cultura diventa quindi un veicolo per l'inclusione sociale, per l'affermazione dei diritti e per la promozione di una società più giusta e rispettosa della dignità di ciascuno. Questo approccio inclusivo non migliora solo la qualità della vita delle persone, ma contribuisce anche a costruire una comunità più equa e solidale, capace di valorizzare le differenze e di promuovere il benessere collettivo. In definitiva, l'inclusività non è solo una scelta morale, ma rappresenta un pilastro essenziale per lo sviluppo sociale, economico e culturale delle Madonie. Attraverso l'adozione di politiche e iniziative inclusive, il progetto "Madonie Cultura Accessibile" mira non solo a migliorare l'accessibilità ai luoghi culturali, ma anche a costruire una comunità più resiliente e coesa, capace di crescere e prosperare nel lungo termine.

COMUNI CONVOLTI	
ALTE MADONIE	4/9
BASSE MADONIE	3/6
MADONIE IMERESI	1/6
	8/21
COLLABORAZIONE	10/26
% COMUNI COINVOLTI	**38,46%**



Scillato in una notte di “maretta”; ©Tommaso Di Prima, 2016

Nonostante questi punti critici, l'accessibilità è un diritto fondamentale e un investimento importante per la creazione di una società più inclusiva e sostenibile. Con il continuo sviluppo di tecnologie innovative, la riduzione dei costi e l'aumento della consapevolezza, l'accessibilità diventerà sempre più importante nella progettazione e nella gestione degli spazi e dei servizi.

FATTORI TRAINANTI

Inclusione sociale: L'accessibilità mira a rendere gli spazi e i servizi fruibili da tutti, indipendentemente dalle loro capacità fisiche, sensoriali o cognitive. Questo promuove l'inclusione sociale e permette a tutti di partecipare pienamente alla vita della comunità.

Miglioramento della qualità della vita: L'accessibilità può migliorare significativamente la qualità della vita delle persone con disabilità, permettendo loro di vivere in modo più autonomo e indipendente.

Incremento dell'equità: L'accessibilità rimuove le barriere che ostacolano la partecipazione delle persone con disabilità alla vita sociale, economica e culturale, promuovendo l'equità e la pari opportunità.

Sviluppo economico: L'accessibilità può generare benefici economici per le imprese e le comunità, creando un mercato più ampio per prodotti e servizi accessibili e favorendo il turismo accessibile.

Creazione di posti di lavoro: L'industria dell'accessibilità sta creando nuovi posti di lavoro in settori come la progettazione, la produzione e la fornitura di prodotti e servizi accessibili.

PUNTI CRITICI

Costi iniziali: L'adeguamento degli spazi e dei servizi per renderli accessibili può essere costoso, soprattutto per edifici o strutture esistenti.

Mancanza di consapevolezza: Non tutti sono a conoscenza dell'importanza dell'accessibilità e delle normative vigenti in materia.

Barriere normative: In alcuni casi, le normative edilizie o gli standard di finanziamento possono ostacolare l'implementazione di soluzioni accessibili.

Difficoltà tecniche: La progettazione e la realizzazione di soluzioni accessibili possono essere complesse e richiedono competenze specialistiche.

Mancanza di incentivi: In alcuni casi, non ci sono incentivi sufficienti per incoraggiare i proprietari o gli amministratori a rendere i loro spazi accessibili.

Piano Battaglia; ©Quelli del Parco delle Madonie, 2023

VALUTAZIONE DEI CRITERI SMART PER IL RAGGIUNGIMENTO DI ENERGY COMMUNITIES E PROPOSTE DI INTERVENTO

Il campo di tulipani di Blufi; ©Deborah Rosiello, 2023

11.1 - LE COMUNITÀ ENERGETICHE

Una comunità energetica è un gruppo di individui, aziende o enti che si associano per condividere, produrre e gestire l'energia in modo collaborativo e sostenibile.

All'interno di una comunità energetica, i partecipanti possono impiegare diverse fonti di energia, quali l'energia solare, eolica o altre fonti rinnovabili, e condividere l'energia generata tra loro attraverso reti intelligenti.

Questo modello di organizzazione energetica persegue l'obiettivo di decentralizzare la produzione e la gestione dell'energia, consentendo ai membri della comunità di agire sia come produttori che consumatori.

Tale approccio può condurre a una maggiore efficienza, a una riduzione delle emissioni di carbonio e a una maggiore autonomia energetica per le comunità coinvolte.

Inoltre, le comunità energetiche favoriscono spesso l'adozione di tecnologie avanzate, come i sistemi di accumulo dell'energia e i dispositivi di gestione intelligente, per ottimizzare l'uso delle risorse energetiche disponibili.

Le comunità energetiche rappresentano una forma di azione collettiva e collaborativa nella transizione verso un sistema energetico sostenibile. Esse costituiscono un nucleo di realtà che optano per l'alimentazione delle proprie utenze con energia pulita, autoprodotta e condivisa.

Questa opportunità consente di migliorare l'impatto ambientale individuale e collettivo, ridurre i costi delle bollette, contribuire allo sviluppo di reti energetiche sostenibili e accedere agli incentivi per l'energia condivisa.

11.2 - Struttura e Funzionamento delle Comunità Energetiche

I Membri

Le comunità energetiche possono essere costituite da una varietà di soggetti, tra cui persone fisiche, piccole e medie imprese (PMI), enti territoriali, autorità locali, amministrazioni comunali, enti di ricerca e formazione, enti religiosi, enti del terzo settore e associazioni.

Ogni membro, che può anche essere un azionista, è considerato un cliente finale con un'utenza, una bolletta energetica e un codice POD.

Per le imprese private, la partecipazione alla comunità energetica non deve costituire l'attività commerciale o industriale principale.

Inoltre, tutti i membri devono essere collegati a punti di connessione ubicati su reti elettriche alimentate dalla medesima cabina primaria.

L'Impianto

La comunità energetica fornisce energia alle utenze dei suoi membri attraverso uno o più impianti di produzione energetica rinnovabile, situati in prossimità delle utenze stesse. Gli impianti possono essere nuovi, esistenti, potenziati o adeguati e possono appartenere a uno o più membri della comunità energetica o a enti terzi. È fondamentale che la comunità energetica abbia la piena disponibilità e controllo degli impianti. Gli impianti rinnovabili costituiti prima del 15 dicembre 2021 possono essere inclusi, purché non superino il 30% della potenza complessiva della comunità energetica.

Gli impianti ibridi sono esclusi. Per accedere agli incentivi, gli impianti devono avere una potenza pari o inferiore a 1 MW e devono essere connessi alla stessa cabina primaria dei membri della comunità energetica.

Tutti gli impianti devono essere registrati nel sistema GAUDÌ di Terna e identificati con il codice CENSIMP.

Iter di Costituzione

- **costituzione dell'unione legale:** I partner, inclusi cittadini, imprese ed enti locali, devono costituire un'entità giuridica no profit (ad esempio, associazione, cooperativa, partenariato, consorzio) e classificare la comunità energetica come soggetto giuridico autonomo.
- **regolamentazione dei rapporti:** È necessario regolamentare i rapporti tra i partner della comunità energetica e definire le modalità di distribuzione dei ricavi derivanti dall'energia condivisa mediante un contratto di diritto privato.
- **redazione dello statuto:** Redigere lo Statuto o l'atto costitutivo della comunità energetica, specificando l'oggetto della comunità e il soggetto delegato per i rapporti con il Gestore dei Servizi Energetici (GSE).
- **registrazione e istanza di accesso:** Dopo l'installazione degli impianti rinnovabili e la loro registrazione nel sistema GAUDÌ, procedere con la redazione dell'istanza per l'accesso ai servizi e ai meccanismi di valorizzazione e incentivazione dell'energia elettrica condivisa.

Compenso

Le risorse del Piano Nazionale di Ripresa e Resilienza (PNRR) per la transizione energetica e gli incentivi destinati all'autoconsumo collettivo e alle comunità energetiche offrono significativi fondi disponibili.

L'accesso agli incentivi per l'energia condivisa è

basato su un sistema di tariffazione che premia l'energia autoconsumata istantaneamente e prevede compensi periodici corrisposti dal GSE per i benefici ambientali e sociali generati dalla comunità energetica:

- tariffa premio MiTE fissa per 20 anni di 110 €/MW sull'energia condivisa nella comunità.
- Rimborso fisso per 20 anni di circa 7-9 €/MW sull'energia condivisa per valorizzare i benefici forniti alla rete.
- compenso variabile per la vendita dell'energia immessa in rete, basato sul prezzo zonale (PUN).

I compensi non sono soggetti a tassazione; pertanto, ogni membro continua a pagare la bolletta al proprio fornitore di energia elettrica e riceve periodicamente dalla comunità energetica un contributo per la condivisione dei benefici generati.

Partecipazione Aperta e Volontaria
La partecipazione a una comunità energetica è aperta e volontaria. Persone fisiche, imprese, associazioni, enti e autorità locali possono aderire liberamente alla comunità e, altrettanto liberamente, decidere di uscirne senza alcun vincolo.

Obiettivo No Profit, ma Vantaggioso
Il principale scopo di una comunità energetica è quello di generare benefici ambientali e sociali per i propri membri e per le aree locali in cui opera. Sebbene non persegua fini di lucro, la comunità energetica contribuisce positivamente al contesto in cui è inserita.

Gestione Autonoma e Controllata
La gestione e il controllo delle attività della comunità energetica sono effettuati dai membri e/o azionisti stessi, che operano sotto la supervisione di esperti del settore energetico. Gli impianti di produzione sono situati nelle vicinanze della comunità, facilitando una gestione diretta e controllata.

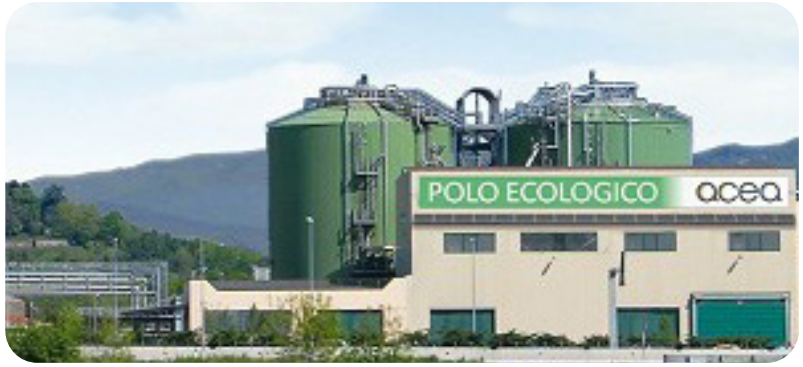
Possibilità di Immagazzinamento
L'energia elettrica prodotta dagli impianti rinnovabili può essere immagazzinata in sistemi di accumulo. Questa energia può essere utilizzata nei periodi in cui l'impianto non è in funzione o per sopperire a eventuali carenze energetiche, garantendo una continuità di approvvigionamento.

Vendita e Consegna dell'Energia Prodotta
Nel caso in cui vi sia un surplus di energia prodotta, questa può essere venduta sul mercato o ceduta al Gestore dei Servizi Energetici (GSE). Questa operazione può generare ritorni economici che contribuiscono a ridurre la spesa energetica dei membri della comunità.

Mantenimento dei Diritti del Cliente Finale
I membri della comunità energetica conservano tutti i diritti di cliente finale, inclusa la libertà di scegliere il proprio fornitore di energia. Questo consente loro di beneficiare dei vantaggi della comunità energetica senza compromettere la propria autonomia come consumatori.

Pollina; ©Marco Giambelluca, 2023

Consorzio Pinerolo Energia



LOCALIZZAZIONE

Comune: Pinerolo

Zona climatica: E

Temperature massime medie (°C):
27 °C - 13°C

Venti prevalenti:
SSO

POSIZIONAMENTO	PIANI VIGENTI
PICCOLA CITTÀ	PAESAGGISTICO

La Comunità energetica

In Piemonte, il Consorzio Pinerolo Energia (CPE), insieme al Politecnico di Torino ed ACEA, sta ponendo le basi per realizzare una comunità energetica tra diversi comuni della città metropolitana di Torino che, già coinvolti nel progetto "Oil Free Zone Territorio Sostenibile", hanno ridotto la produzione di energia da fonti fossili portando la loro capacità di autoproduzione energetica al 42%.
L'obiettivo del progetto è puntare al 100%.

Il nucleo di partenza della futura Comunità Energetica è costituito da utenti pubblici e privati ed in particolare dai Comuni di Cantalupa, Frossasco, Roletto, San Pietro Val Lemina, Scalenghe e Vigone con i rispettivi cittadini e da 5 aziende membri del Consorzio CPE tra le quali Acea Pinerolese Industriale (API) S.p.A. Saranno, inoltre, coinvolte diverse categorie di soggetti (consumer, prosumer, produttori), di utenze (aziende, utenti pubblici comunali e residenziali) e di tecnologie per la produzione di energie rinnovabili e non rinnovabili. Sono 162, tra pubblici e privati, gli impianti previsti in grado di soddisfare i fabbisogni energetici locali per una produzione di energia elettrica da rinnovabili di circa 16,9 GWh/anno.

Tale contributo arriverà dall'impianto idroelettrico da 450 kW di Inverso Pinasca e da un impianto a biogas, generato dal trattamento dei rifiuti organici, in grado di produrre circa l'80% del fabbisogno energetico della comunità generando circa 10 milioni di metri cubi di biogas all'anno, da cui verranno prodotti circa 17,1 GWh/anno di energia elettrica. 144 gli impianti fotovoltaici da 3 kW, ciascuno distribuiti tra le utenze private, per coprire il 3% dei fabbisogni insieme ad ulteriori 13 di proprietà pubblica e privata con una potenza variabile tra gli 8,4 kW a 62 kW. A questi si aggiunge un ulteriore impianto fotovoltaico, di proprietà API, da 113 kW e in grado di produrre 114 MWh/anno circa.

Sul fronte termico, l'impianto di biogas, unico prosumer termico, è in grado di produrre 18,8 GWh/anno di energia termica, distribuendo la quota tra la rete di teleriscaldamento e le sedi della sua azienda. Il fabbisogno di energia termica soddisfatto con energie rinnovabili varia, in base all'immissione del contributo delle caldaie degli utenti privati nella rete, dal 10 al 24 %. La forma istituzionale prevista in fase di avvio è quella di una "Associazione Temporanea di Scopo" da trasformare poi in cooperativa.

Energia Agricola a Km0

LOCALIZZAZIONE

Regione: Veneto

Zona climatica: E

Temperature massime medie (°C):
27 °C - 13°C

Venti prevalenti:
SSO

POSIZIONAMENTO	PIANI VIGENTI
PICCOLA CITTÀ	PAESAGGISTICO

La prima comunità agro energetica italiana certificata 100% - EKOenergy

La Coldiretti Veneto e la Società ForGreen SPA SB hanno avviato la prima comunità agro energetica 100% rinnovabile, in cui sono stati coinvolti 668 soci, tra utenti possessori di impianti ad energia rinnovabile, in grado di produrre e scambiare energia verde, consumatori dell'energia prodotta nel ciclo comunitario. In questo modello, in particolare, gli imprenditori agricoli in possesso dell'impianto di produzione assumono sia il ruolo di autoproduttori di energia da fonti rinnovabili, per soddisfare le proprie necessità, sia il ruolo di produttori attivi, o prosumer, producendo e cedendo a terzi il proprio surplus energetico verde.
Grazie agli impianti installati nelle aziende degli utenti che aderiscono alla Comunità energetica, tutti solari fotovoltaico, sarà possibile produrre 1.811 MWh/a circa di energia elettrica, di cui usufruiranno anche gli 89 uffici centrali e periferici della Coldiretti Veneto. Tutta l'energia di filiera viene raccolta e gestita dal partner tecnico ed energetico che ritira l'eccedenza energetica degli imprenditori agricoli e, senza oneri di gestione a Prezzo Zonale Orario, la mette a disposizione della Comunità Energetica Agricola a condizioni economiche più vantaggiose della normale fornitura. Uno sconto in bolletta che si aggiunge ai premi proporzionati all'autoconsumi della Comunità.
Un sistema energetico innovativo, in grado non solo di ridurre i costi in bolletta delle imprese agricole, ma anche di risparmiare l'emissione in atmosfera di circa 2.178 tonnellate l'anno di CO_2 stimolando le imprese agricole ad utilizzare strumenti di green marketing, ed a promuovere al meglio l'impresa agricola, i prodotti agroalimentari e il territorio.
Particolarità del progetto Energia agricola a km 0 è quello di spingere un modello di transizione energetica che mira a sviluppare una piattaforma basata su protocollo blockchain in grado di registrare in automatico gli scambi, collegando l'elettricità in uscita dal fornitore a quella in entrata dei consumatori. La prospettiva, infatti, è quella di sviluppare una rete integrata anche con sistemi di accumulo delle imprese agricole per offrire anche un servizio di stabilizzazione della rete.

Comunità energetica di Solisca

LOCALIZZAZIONE

Regione: Lombardia

Comune: Turano Lodigiano

Zona climatica: E

Temperature massime medie (°C):
24 °C - 9°C

Venti prevalenti:
SO

POSIZIONAMENTO	PIANI VIGENTI
PICCOLA CITTÀ	PAESAGGISTICO

La Comunità energetica

SOLISCA, la Comunità Energetica di Turano Lodigiano, Comune di 1500 abitanti in Provincia di Lodi.
Solisca è il femminile di Sole, fonte di energia rinnovabile che alimenta la CER di Turano: 47 kW di pannelli fotovoltaici posizionati sul tetto della palestra e del campo sportivo adiacenti all'edificio comunale, più una colonnina di ricarica per veicoli elettrici a cui è collegato anche un servizio di car-sharing. La Comunità è composta dal Comune in qualità di Prosumer (produttore e consumatore dell'energia elettrica, che detiene 9 punti di prelievo) e da altri 15 Consumer (solo consumatori) tra cui la parrocchia e diversi nuclei famigliari a basso reddito. L'energia generata serve indirettamente la cittadinanza anche alimentando l'auto elettrica, che viene utilizzata dal Comune per i servizi dal lunedì al venerdì, dalle 7 alle 16, mentre negli altri orari è prenotabile tramite app dai cittadini.
L'impianto fotovoltaico è stato realizzato da Sorgenia come intervento per oneri di compensazione della Centrale elettrica installata dall'azienda a Bertonico Turano Lodigiano nel 2011 (impianto a ciclo combinato con 800 MW di potenza, alimentato a gas naturale).
Inaugurata a gennaio 2022, prima CER della Lombardia, prima CERS (Comunità Energetica Rinnovabile e Solidale) del Nord Italia e prima ad essere stata completamente digitalizzata.
Solisca è servita da una piattaforma digitale messa a punto da Sorgenia che permette di visualizzare e monitorare i dati di produzione, consumo e prelievo, compresi quelli degli utenti individuali, dalla rete della CER in tempo reale. L'interfaccia mostra anche i "ricavi economici" della Comunità che alla fine del primo anno verranno suddivisi tra i suoi soci sulla base del regolamento con attenzione particolare ai nuclei a basso reddito.

A circa un anno di funzionamento l'impianto ha prodotto circa 50 MW di energia, il 30% dei quali sono stati condivisi tra i soci. Quasi 15 MW di autoconsumo virtuale quindi, che corrispondono a 26 tonnellate di CO_2 evitata, l'equivalente di quella assorbita da 158 alberi. Questa energia condivisa tra i soci riceve l'incentivo del GSE a cui si aggiungono i ricavi per l'energia immessa in rete ed il risparmio per quella evitata ossia l'autoconsumo reale di energia solare consumata direttamente sul posto, generando un beneficio economico complessivo di quasi 15 mila euro.

Comunità energetica di San Giovanni

LOCALIZZAZIONE

Regione: Campania

Quartiere: Teduccio

Zona climatica: C

Temperature massime medie (°C):
33 °C - 13°C

Venti prevalenti:
SSO

POSIZIONAMENTO	PIANI VIGENTI
QUARTIERE	NESSUNO

Comunità energetica a Teduccio, Napoli

Parte da Napoli la rivoluzione energetica delle comunità da fonti rinnovabili. Il progetto è promosso da Legambiente e a far parte della comunità saranno la Fondazione Famiglia di Maria e 40 famiglie del quartiere di San Giovanni a Teduccio, e verrà realizzata grazie al supporto della Fondazione con il sud. Sul tetto della sede della fondazione sarà installato un impianto solare da 53 kw e per la prima volta in Italia l'energia prodotta sarà condivisa con le famiglie del quartiere. Nei prossimi giorni sarà costituita formalmente la comunità energetica e il 22 Marzo partirà il cantiere che durerà circa dieci giorni. Successivamente verrà fatta domanda di allaccio alla rete elettrica, e nel mese di Aprile l'impianto inizierà a funzionare con la distribuzione di energia pulita alla Fondazione e alle famiglie.

L'impianto solare sarà realizzato dall'impresa 3E di Napoli. Il lavoro di Legambiente e di Fondazione Famiglia di Maria continuerà con le bambine e i bambini, le mamma e le associazioni del quartiere. Saranno protagonisti di percorsi di educazione ambientale, di azioni di cittadinanza attiva monitorando i loro consumi e elettrici e le dispersioni di calore delle loro abitazioni attraverso la campagna Civico 5.0 sulla qualità dell'abitare, info day per scuole superiori sulle possibilità occupazionali legate ai green jobs e per le associazioni e cittadini del quartiere su bonus e occasioni per migliorare la qualità dell'abitare e del vivere e abbassare costi e consumi .

Le comunità energetiche rappresentano un modello di collaborazione e sostenibilità che consente a gruppi di persone, imprese e enti di condividere e gestire l'energia in modo efficiente e ecologico.
Per ottimizzare ulteriormente questi sistemi e promuovere un approccio più sostenibile, è fondamentale integrare soluzioni tecnologiche che sfruttino le risorse naturali disponibili. In questo contesto, le soluzioni tecnologiche saranno orientate verso l'ottimizzazione delle tre principali fonti di energia rinnovabile: l'acqua, il vento e il sole.

- **Sfruttamento dell'acqua: energia idrica e sistemi di recupero**

Le risorse idriche possono giocare un ruolo cruciale nelle comunità energetiche attraverso l'implementazione di tecnologie per l'energia idroelettrica e il recupero delle acque piovane. Le soluzioni tecnologiche per l'energia idrica includono:

Microcentrali idroelettriche: Questi impianti, situati lungo piccoli corsi d'acqua o canali, possono generare energia elettrica sfruttando il flusso dell'acqua. Le microcentrali sono particolarmente adatte per aree rurali e possono essere integrate senza grandi impatti ambientali.

Sistemi di recupero delle acque piovane: Attraverso la raccolta e il trattamento delle acque piovane, è possibile utilizzare l'acqua per usi non potabili come l'irrigazione e il raffreddamento degli impianti. Questa pratica riduce il consumo di acqua potabile e migliora l'efficienza complessiva del sistema energetico.

- **Sfruttamento del vento: turbine e sistemi di monitoraggio**

L'energia eolica rappresenta una risorsa significativa per le comunità energetiche e può essere ottimizzata attraverso:

Turbine eoliche di piccola scala: Questi impianti possono essere installati in aree con buona ventilazione per generare energia elettrica. Le turbine eoliche di piccola scala sono particolarmente utili per le comunità energetiche che operano in zone ventose e possono integrare l'energia eolica con altre fonti rinnovabili.

Sistemi di monitoraggio e previsione del vento: L'uso di sensori avanzati e modelli predittivi per monitorare le condizioni del vento consente di ottimizzare il funzionamento delle turbine eoliche, migliorando l'efficienza della produzione energetica e riducendo i costi operativi.

- **Sfruttamento del sole: pannelli solari e sistemi di accumulo**

L'energia solare è una delle fonti di energia rinnovabile più diffuse e può essere potenziata con:

Pannelli fotovoltaici avanzati: L'installazione di pannelli solari ad alta efficienza consente di convertire la luce solare in energia elettrica. Tecnologie come i pannelli bifacciali, che catturano la luce solare da entrambi i lati, possono aumentare la produzione energetica.

Sistemi di accumulo dell'energia solare: L'integrazione di batterie ad alte prestazioni permette di immagazzinare l'energia prodotta durante le ore di sole per un uso successivo, garantendo una fornitura continua anche durante le ore senza luce.

L'integrazione di tecnologie avanzate per sfruttare l'acqua, il vento e il sole rappresenta un passo fondamentale per l'ottimizzazione delle comunità energetiche.

Questi approcci non solo migliorano l'efficienza energetica e riducono le emissioni di carbonio, ma contribuiscono anche a creare sistemi energetici più resilienti e sostenibili.

Adottando soluzioni innovative e integrate, le comunità energetiche possono raggiungere una maggiore autonomia, ridurre i costi e promuovere un futuro energetico più verde e inclusivo.

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LEGENDA ICONE

Ambito urbano

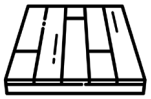
Ambito residenziale

Ambito residenziale

Tecnologie in off-shore

Tecnologie on-shore

Tecnologie a uso fotovoltaico



Pavimenti evergetici

Vele

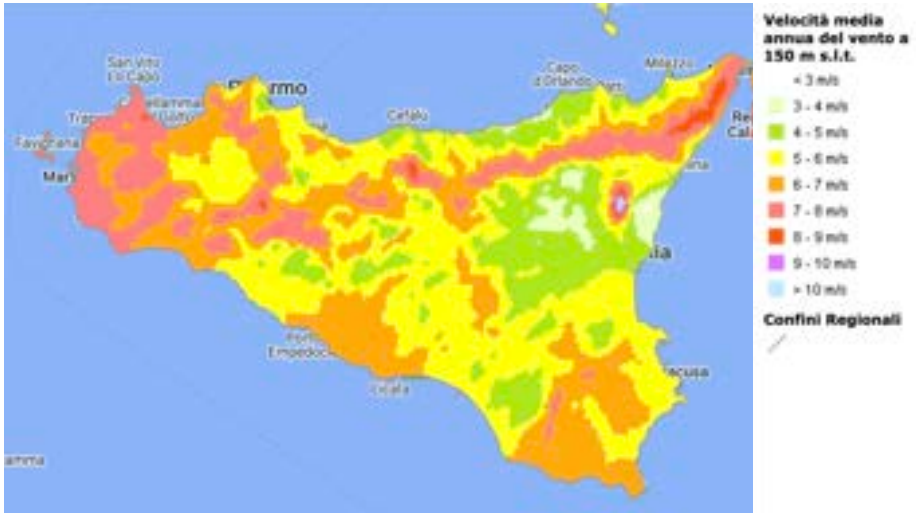
Alcune schede tecniche sono corredate di un alert, che segnala la compatibilità dell'intervento con il contesto:
Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.
Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

Prima di introdurre dispositivi tecnologici volti a convertire l'energia eolica in elettricità, è fondamentale soffermarsi e comprendere le ragioni che giustificano la proposta di tale implementazione nel territorio delle Madonie. Secondo l'ATLA EOLICO, l'area madonita beneficia di una percentuale di vento significativa, con velocità che variano dai 4-5 m/s fino agli 8-9 m/s On-Shore, ovvero venti che provengono perpendicolarmente dalla costa verso l'interno del territorio.

I generatori eolici, siano essi ad asse verticale o orizzontale, necessitano di una velocità minima del vento, chiamata cut-in, compresa tra 3 e 5 m/s, e raggiungono la potenza di progetto con venti di velocità tra i 12 e i 14 m/s. Le condizioni favorevoli riscontrate nell'area oggetto di studio rappresentano dunque un'opportunità ideale per l'adozione di tecnologie come il minieolico e il microeolico. Questi sistemi possono essere installati anche in ambito residenziale, rappresentando una valida alternativa agli ormai obsoleti pannelli fotovoltaici e solari termici, i quali presentano un impatto ambientale e visivo significativo.

Minieolico

Il minieolico, o piccolo eolico, consiste nella produzione di energia elettrica attraverso l'uso di aerogeneratori di altezza inferiore ai 30 metri. Tali impianti possono essere utilizzati sia per alimentare utenze isolate non connesse alla rete elettrica, sia per la produzione di energia destinata all'autoconsumo in regime di scambio o per la fornitura di energia alla rete nazionale. La principale differenza tra il minieolico e il grande eolico, oltre alle dimensioni delle macchine, risiede nella capacità del minieolico di operare economicamente anche con regimi di vento inferiori rispetto a quelli necessari per i grandi impianti industriali. Questo lo rende particolarmente adatto per il territorio madonita, dove le condizioni di vento sono ideali per questo tipo di tecnologia.



La Sicilia nell'ATLA EOLICO; ©Atlante Eolico, 2024

Microeolico

Il microeolico, invece, si riferisce a impianti portatili di piccole dimensioni, capaci di generare potenze inferiori a 1 kW. Questi impianti sono ideali per alimentare piccole strutture come camper, cucine e ospedali da campo, server e router wireless in località remote come spiagge o campeggi, nonché barche a vela e yacht. La potenza erogata da questi dispositivi è sufficiente a fornire energia per apparecchi a basso consumo, come lampade fluorescenti, frigoriferi ecologici e laptop, ma non è adeguata per alimentare elettrodomestici che richiedono resistenze elettriche elevate, come forni, scaldabagni o lavatrici.

L'adozione di soluzioni eoliche di piccola scala, come il minieolico e il microeolico, si presenta dunque come un'opzione sostenibile ed efficiente per sfruttare le risorse naturali del territorio, riducendo al contempo l'impatto ambientale e visivo, e offrendo una valida alternativa alle tecnologie tradizionali. Queste soluzioni non solo rispondono alle esigenze energetiche locali, ma promuovono anche un approccio più ecologico e innovativo nella gestione delle risorse.

In. 01 MULINO IDRAULICO

PRINCIPIO DI FUNZIONAMENTO

Il mulino idraulico sfrutta l'energia cinetica e potenziale dell'acqua corrente per generare energia meccanica, che può essere utilizzata direttamente per macinare grano, segare legna, o, con opportuni adattamenti, per generare energia elettrica.

Componenti principali:

Ruota idraulica: La parte principale del mulino, che può essere una ruota a pale, ruota a tazze, o ruota a cucchiaio. Viene azionata dal flusso dell'acqua.

Albero di trasmissione: Collega la ruota idraulica ai meccanismi interni del mulino, trasmettendo l'energia meccanica generata.

Ingranaggi e meccanismi interni: Trasformano e trasmettono l'energia meccanica per il lavoro desiderato (ad esempio, la macinazione del grano).

APPLICABILITÀ

Recupero dei vecchi mulini ad acqua:

Rurale: In aree rurali, dove i vecchi mulini possono essere restaurati per scopi agricoli, turistici o educativi.

Urbana: Nei parchi cittadini o nei musei per scopi educativi e culturali.

Generazione di energia: Con modifiche moderne, i vecchi mulini possono essere utilizzati per generare energia idroelettrica, contribuendo alla produzione di energia rinnovabile.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Utilizza una fonte di energia sostenibile e rinnovabile, Recupero e valorizzazione di strutture storiche, Costi operativi ridotti dopo l'installazione iniziale e il restauro, Strumenti per l'educazione ambientale e storica.

Svantaggi: Il restauro e l'adeguamento dei vecchi mulini possono essere costosi, Richiede manutenzione regolare per garantire l'efficienza e la sicurezza, Funziona solo in presenza di corsi d'acqua con sufficiente flusso.

Rischi: L'intervento su corsi d'acqua può alterare l'ecosistema locale, Vecchi mulini possono avere problemi strutturali che necessitano di interventi significativi, L'investimento iniziale può essere elevato e richiedere tempo per il ritorno economico.

SINERGIE E INTERAZIONI

I mulini restaurati possono diventare attrazioni turistiche, contribuendo all'economia locale, Possono essere utilizzati come laboratori per l'educazione ambientale e storica, I mulini possono supportare le attività agricole locali, fornendo energia per vari processi. I mulini ad acqua convertiti in mini-centrali idroelettriche possono fornire energia alle reti locali, riducendo la dipendenza da fonti fossili.
Progetti di recupero possono beneficiare di collaborazioni tra enti pubblici, associazioni culturali e imprese private.

NORMATIVA DI RIFERIMENTO

Direttiva Europea RED II, Decreto Legislativo 199/2021, Decreto Legislativo 210/2021, Delibera ARERA 727/2022/R/eel, Decreto Ministeriale 23 febbraio 2024

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

CORTEN, GRIGIO CANNA DI FUCILE

SPECIFICHE TECNICHE

IL RECUPERO DEI MULINI E' SEMPRE APPLICABILE CON INTERVENTI DI RECUPERO RISPETTOSI DELLA STORICITA' DEL LUOGO E DELL'ARCHITETTURA

Consigliato per edifici isolati: interventi di facile applicazione, senza particolari restrizioni.

Esempi di Mulini ad acqua recuperati in italia

Mulino di Piazza Roncas, Aosta

Mulino di Ciuffenna, Arezzo

Mulinetto della Crona, Treviso

Mulino di Olzai, Nuoro

Mulino di Olona, Milano

Mulino di Turano, Rieti

In. 02 TURBINE IDROELETTRICHE A FLUSSO LIBERO

PRINCIPIO DI FUNZIONAMENTO

Le turbine fluviali, note anche come turbine idroelettriche a flusso libero, sono dispositivi progettati per sfruttare l'energia cinetica dei corsi d'acqua senza la necessità di costruire dighe o bacini di accumulo. Questa tecnologia è particolarmente adatta per corsi d'acqua con flusso costante e rappresenta una soluzione ecologica per la produzione di energia rinnovabile. Le componenti principali includono:
Rotore: Consiste in pale che ruotano quando l'acqua scorre attraverso di esse.
Generatore: Converte l'energia meccanica del rotore in energia elettrica.
Supporto e ancoraggio: Strutture che mantengono la turbina stabile e ancorata al letto del fiume o sospesa nel flusso d'acqua.

APPLICABILITÀ

Le turbine fluviali possono essere utilizzate in vari contesti:
Corsi d'acqua naturali: Fiumi, torrenti e ruscelli con flusso costante e adeguato.
Canali artificiali: Sistemi di irrigazione, canali di bonifica e altri canali costruiti dall'uomo.
Sistemi ibridi: Integrati in infrastrutture esistenti come dighe di piccole dimensioni o altri sistemi di gestione delle acque.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Sfrutta una fonte di energia sostenibile e continua, Non richiede la costruzione di dighe o la modifica significativa del corso d'acqua, Può essere installata in diverse posizioni senza grandi opere infrastrutturali, Può essere utilizzata in vari tipi di corsi d'acqua e condizioni di flusso.
Svantaggi: L'efficienza può dipendere dalla velocità e dal volume del flusso d'acqua, Richiede manutenzione regolare per rimuovere detriti e garantire il funzionamento ottimale, L'installazione e l'acquisto delle turbine possono essere costosi.
Rischi: Possibile impatto sulla fauna fluviale e sugli ecosistemi locali, Rischio di danni durante le piene o periodi di forte corrente, Potenziali conflitti con le attività di navigazione o ricreative nei corsi d'acqua.

SINERGIE E INTERAZIONI

Le turbine fluviali possono essere integrate nelle reti energetiche locali, fornendo energia pulita e decentralizzata. Possono essere parte di iniziative più ampie di sostenibilità ambientale e gestione delle risorse idriche. Progetti di installazione possono beneficiare di collaborazioni con autorità locali, comunità e imprese private. Possono essere utilizzate come esempi di tecnologie sostenibili nelle scuole e nelle università. Possono essere combinate con soluzioni solari o eoliche per creare sistemi energetici ibridi e resilienti.

NORMATIVA DI RIFERIMENTO

Direttiva Europea RED II, Decreto Legislativo 199/2021, Decreto Legislativo 210/2021, Delibera ARERA 727/2022/R/eel, Decreto Ministeriale 23 febbraio 2024

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

QUESTE, ESSENDO INSTALLATE ALL'INTERNO DI TORRENTI, SONO SEMPRE APPLICABILI POICHE' NON HANNO GRANDE IMPATTO PAESAGGISTICO

In. 03 MULINI A VENTO

PRINCIPIO DI FUNZIONAMENTO

I mulini a vento funzionano convertendo l'energia cinetica del vento in energia meccanica. Le pale del mulino catturano il vento e, grazie alla loro forma aerodinamica, generano un movimento rotatorio. Questo movimento è trasferito tramite un sistema di ingranaggi all'albero principale del mulino, che può essere collegato a diversi meccanismi operativi, come una macina per la macinazione dei cereali o una pompa per l'estrazione dell'acqua. Il design e l'orientamento delle pale sono cruciali per ottimizzare l'efficienza del mulino, permettendo di sfruttare al meglio le varie intensità e direzioni del vento.

APPLICABILITÀ

I mulini a vento possono essere utilizzati in diverse applicazioni:
Agricoltura: Per macinare i cereali e produrre farina.
Idraulica: Per pompare acqua da pozzi o per l'irrigazione dei campi.
Energia: Per generare elettricità, nel caso dei moderni aerogeneratori.
Industria: Per azionare macchinari e processi produttivi che richiedono energia meccanica.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: I mulini a vento utilizzano una fonte di energia rinnovabile e inesauribile, Non producono emissioni inquinanti né gas serra, Una volta costruiti, i costi di mantenimento sono relativamente bassi, Possono essere adattati a diverse necessità operative, dalla macinazione alla produzione di energia.
Svantaggi: L'efficienza del mulino dipende dalla disponibilità del vento, che può essere variabile, Le strutture possono essere considerate ingombranti o poco estetiche nel paesaggio, Il movimento delle pale e degli ingranaggi può generare rumore, disturbando le aree circostanti.
Rischi: Tempeste o venti molto forti possono danneggiare la struttura del mulino, Sebbene i costi siano bassi, una manutenzione inadeguata può portare a guasti o inefficienze. I mulini, in particolare i moderni aerogeneratori, possono rappresentare un pericolo per gli uccelli e altri animali volanti.

SINERGIE E INTERAZIONI

I mulini a vento possono interagire sinergicamente con altre tecnologie e settori:
Energia solare: L'energia eolica può essere combinata con quella solare per creare sistemi ibridi di produzione energetica, garantendo una fornitura più stabile e continua.
Agricoltura sostenibile: Integrando i mulini a vento per l'irrigazione e la macinazione, le aziende agricole possono ridurre la dipendenza dai combustibili fossili e migliorare l'efficienza delle risorse.
Sistemi di accumulo energetico: L'energia prodotta dai mulini può essere immagazzinata in batterie o utilizzata per produrre idrogeno, migliorando la gestione energetica e l'autosufficienza.
Turismo e didattica: I mulini a vento, soprattutto quelli storici, possono diventare attrazioni turistiche e strumenti educativi per sensibilizzare il pubblico sull'energia rinnovabile e la storia industriale.

NORMATIVA DI RIFERIMENTO

Direttiva Europea RED II, Decreto Legislativo 199/2021, Decreto Legislativo 210/2021, Delibera ARERA 727/2022/R/eel, Decreto Ministeriale 23 febbraio 2024

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

IL RECUPERO DEI MULINI A VENTO E' SEMPRE APPLICABILE CON INTERVENTI DI RECUPERO RISPETTOSI DELLA STORICITA' DEL LUOGO E DELL'ARCHITETTURA

Esempi di Mulini a vento

Il sentiero del Vallone dei Molini prende il nome dalla presenza di numerosi mulini situati lungo il Torrente Giardinello, autentici reperti di archeologia industriale.

Questo percorso si snoda tra una vegetazione lussureggiante, seguendo il corso dell'acqua.

Tra questi mulini, il più significativo è il Mulino Mazzara, che si trova a 810 metri sul livello del mare.

Completamente avvolto dalla natura, è circondato da maestosi salici e felci regali, che contribuiscono a creare un'atmosfera incantevole.

Il Mulino Mazzara è uno dei meglio conservati della zona e si integra perfettamente nell'ambiente circostante, grazie alla rigogliosa vegetazione che lo ha inglobato, rendendolo un affascinante esempio di simbiosi tra natura e architettura storica.

Mulino a vento, San Mauro Castelverde
Ph: Tania Meli

In. 04 MINIEOLICO URBANO DA PARETE

PRINCIPIO DI FUNZIONAMENTO

La tecnologia del minieolico urbano da parete sfrutta l'energia del vento per generare elettricità in contesti urbani. Questi sistemi sono progettati per essere montati su edifici, integrandosi con l'architettura esistente. Le turbine minieoliche utilizzano pale o rotori che, mossi dal vento, azionano un generatore elettrico. Questo generatore converte l'energia meccanica delle pale in energia elettrica. La configurazione delle pale e l'aerodinamica del sistema sono ottimizzate per funzionare anche con venti di bassa velocità, comuni negli ambienti urbani.

APPLICABILITÀ

I sistemi minieolici urbani da parete possono essere utilizzati in vari contesti:
Residenziale: Per fornire elettricità supplementare alle abitazioni, riducendo la dipendenza dalla rete elettrica. **Commerciale:** Negli edifici commerciali e uffici, per contribuire al fabbisogno energetico e ridurre i costi. **Infrastrutture pubbliche:** Su edifici pubblici come scuole, ospedali e municipi per promuovere l'uso di energia rinnovabile. **Mobilità sostenibile:** Per alimentare stazioni di ricarica per veicoli elettrici.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Utilizza una fonte di energia inesauribile e a basso impatto ambientale, Può ridurre le bollette energetiche per abitazioni e aziende, Può essere installato su edifici esistenti senza necessità di spazio a terra, Contribuisce all'autosufficienza energetica, riducendo la dipendenza dalla rete elettrica.
Svantaggi: La produzione di energia può essere variabile a seconda delle condizioni del vento, Le turbine possono generare rumore, che potrebbe essere fastidioso in aree densamente popolate, Alcuni potrebbero considerare le turbine poco estetiche quando montate su edifici.
Rischi: La manutenzione inadeguata può portare a inefficienze o guasti, Venti estremamente forti o tempeste possono danneggiare le turbine, Anche se minore rispetto ai grandi impianti eolici, c'è il rischio che le turbine possano danneggiare gli uccelli.

SINERGIE E INTERAZIONI

Integrando pannelli solari e turbine eoliche si può garantire una produzione energetica costante e bilanciata. L'energia prodotta può essere immagazzinata in batterie, permettendo di utilizzarla anche quando il vento non soffia. I sistemi minieolici possono essere collegati a reti di gestione dell'energia domestica, ottimizzando l'uso dell'energia prodotta in modo efficiente. Utilizzando l'energia eolica per alimentare stazioni di ricarica per veicoli elettrici, si promuove una mobilità più ecologica. I sistemi minieolici possono essere parte di reti energetiche distribuite, contribuendo alla resilienza e alla stabilità della fornitura energetica urbana.

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DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : M - A
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SPECIFICHE TECNICHE

ALCUNE SOLUZIONI, PERFETTAMENTE MIMETIZZATE CONSENTONO L'APPLICAZIONE SIA IN AMBITO URBANO CHE RESIDENZIALE

Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

In. 05 MINIEOLICO

PRINCIPIO DI FUNZIONAMENTO

Il minieolico utilizza piccole turbine eoliche per convertire l'energia cinetica del vento in energia elettrica. Queste turbine, che sono generalmente di dimensioni ridotte rispetto alle turbine eoliche tradizionali, sono dotate di pale che ruotano quando il vento le colpisce. Il movimento delle pale aziona un generatore che produce elettricità.

APPLICABILITÀ

Il minieolico è applicabile in contesti residenziali, commerciali e industriali, specialmente in aree con velocità del vento adeguate. È ideale per zone rurali, aree isolate o piccole comunità che desiderano produrre energia rinnovabile a scala ridotta. È anche utilizzabile per integrazione in sistemi di energia domestica o aziendale.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Riduce le emissioni di CO2 e contribuisce alla produzione di energia pulita, Permette di produrre energia in loco, riducendo la dipendenza dalla rete elettrica, Una volta installata, la manutenzione è generalmente economica.
Svantaggi: La produzione di energia dipende dalla disponibilità e dalla velocità del vento, che può essere irregolare, I costi di acquisto e installazione delle turbine possono essere elevati, Le turbine possono produrre rumore e avere un impatto estetico sul paesaggio.
Rischi: Le turbine possono essere danneggiate da eventi meteorologici estremi, La manutenzione può essere complessa e costosa se non eseguita regolarmente.

SINERGIE E INTERAZIONI

Sistemi Fotovoltaici: Il minieolico può essere combinato con impianti solari per creare un sistema ibrido che ottimizza la produzione di energia in base alle condizioni climatiche variabili.
Reti di Autoconsumo: Integrare il minieolico in reti di autoconsumo collettivo può migliorare l'efficienza e la sostenibilità energetica a livello locale.
Storage Energetico: L'uso di batterie o sistemi di accumulo può stoccare l'energia prodotta durante i periodi di alta produzione e utilizzarla quando il vento è debole.

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recupero ed efficientamento energetico

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REVERSIBILITÀ : A
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SPECIFICHE TECNICHE

PUO' ESSERE APPLICATO NEGLI EDIFICI PURCHE' NON SIA DI GRANDE IMPATTO PAESAGGISTICO

In. 06 DRONI E AQUILONI

PRINCIPIO DI FUNZIONAMENTO

Droni e Aquiloni per la Produzione di Elettricità sfruttano il vento ad alta quota per generare energia elettrica. Questi dispositivi sono dotati di generatori o sistemi di raccolta dell'energia che convertono il movimento dell'aria in elettricità. Gli aquiloni e i droni sono progettati per salire a quote elevate dove il vento è più costante e intenso. In genere, l'energia è raccolta tramite cavi che collegano il dispositivo al suolo, dove un sistema di accumulo o un generatore trasforma l'energia meccanica in elettricità.

APPLICABILITÀ

Questa tecnologia è applicabile in aree con venti costanti e potenti in alta quota, tipicamente sopra le nuvole o a quote superiori a quelle raggiungibili dai tradizionali aerogeneratori. È adatta per l'uso in regioni remote o su piattaforme marittime, dove le turbine eoliche convenzionali potrebbero non essere praticabili. Può anche essere impiegata per integrazione in reti di energia rinnovabile esistenti o per fornire energia in aree isolate.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Approfitta dei venti più forti e stabili a quote elevate, aumentando la produzione energetica rispetto alle turbine eoliche a bassa quota, Essendo posizionati in quota, hanno un impatto estetico minore sul paesaggio, Non richiedono grandi spazi a terra, riducendo il conflitto con altre attività.
Svantaggi: I sistemi sono tecnicamente complessi e possono richiedere una gestione e manutenzione avanzata, L'installazione e la manutenzione possono essere costose, specialmente per sistemi di controllo e comunicazione a distanza, Sono sensibili a condizioni meteorologiche avverse come tempeste o turbolenze.
Rischi: I droni e aquiloni possono essere suscettibili a problemi di stabilità e controllo, con potenziali rischi di malfunzionamento, Possono esserci rischi di interferenze con aerei o altri dispositivi aerei, e problemi di collisione, L'installazione e il funzionamento possono avere impatti ambientali se non gestiti correttamente.

SINERGIE E INTERAZIONI

Sistemi di Accumulo: L'energia generata può essere immagazzinata in batterie o sistemi di accumulo per un utilizzo successivo o per stabilizzare la rete.
Tecnologia di Monitoraggio: L'uso di sensori e tecnologie di monitoraggio avanzate può ottimizzare le operazioni e la gestione dei droni e aquiloni.
Reti di Energia Rinnovabile: Possono essere integrati in reti di energia rinnovabile esistenti per aumentare la diversità delle fonti di energia e migliorare la resilienza della rete.

NORMATIVA DI RIFERIMENTO

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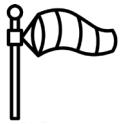

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

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SPECIFICHE TECNICHE

PUO' ESSERE APPLICATO ANCHE NEI CENTRI STORICI POICHE' AD ALTA QUOTA E DUNQUE CON SCARSO IMPATTO PAESAGGISTICO

In. 07 PAVIMENTAZIONI STRADALI ENERGETICHE

PRINCIPIO DI FUNZIONAMENTO

Le pavimentazioni stradali energetiche sono progettate per catturare e convertire l'energia cinetica prodotta dal passaggio dei veicoli e dalle sollecitazioni ambientali in elettricità. Queste pavimentazioni utilizzano materiali speciali e tecnologie come celle piezoelettriche, convertitori di energia cinetica o pannelli fotovoltaici integrati nella superficie stradale. Le celle piezoelettriche generano elettricità quando vengono compresse o deformate dalla pressione dei veicoli, mentre i pannelli fotovoltaici convertono l'energia solare in elettricità.

APPLICABILITÀ

Le pavimentazioni stradali energetiche possono essere applicate in vari contesti, tra cui:
Aree Urbane: Strade e marciapiedi in città dove il traffico è intenso e costante.
Autostrade e Aree di Alta Circolazione: Tratti stradali con alto volume di traffico che possono generare significative quantità di energia.
Spazi Pubblici: Piazze, parcheggi e aree pedonali dove è possibile installare pavimentazioni energetiche per alimentare l'illuminazione pubblica e altre infrastrutture.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Contribuiscono alla produzione di energia rinnovabile direttamente sul posto e riducono la dipendenza dalle fonti energetiche tradizionali, Sfruttano l'energia che altrimenti andrebbe sprecata, come quella prodotta dal traffico stradale, Possono ridurre l'impatto ambientale delle infrastrutture stradali grazie alla produzione di energia pulita.
Svantaggi: L'installazione e la manutenzione possono essere costose rispetto ai materiali stradali tradizionali, Le pavimentazioni possono subire usura e danni, richiedendo manutenzione regolare e potenzialmente costosa, La quantità di energia prodotta può variare in base al traffico, alle condizioni atmosferiche e alla qualità della pavimentazione.
Rischi: Se non progettate e mantenute correttamente, le pavimentazioni energetiche possono compromettere la sicurezza stradale, La produzione dei materiali speciali può avere un impatto ambientale che deve essere considerato nel ciclo di vita del progetto, I sistemi tecnologici integrati possono essere soggetti a guasti o malfunzionamenti.

SINERGIE E INTERAZIONI

L'energia prodotta può alimentare l'illuminazione pubblica, riducendo la dipendenza dalla rete elettrica. Può essere integrata in reti di energia rinnovabile esistenti, contribuendo alla diversificazione delle fonti di energia. Interagire con sistemi di smart grid per ottimizzare l'uso dell'energia e migliorare l'efficienza della distribuzione energetica.

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recupero ed efficientamento energetico

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REVERSIBILITÀ : A
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SPECIFICHE TECNICHE

APPLICABILE NELLE ZONE NON UBICATE AL CENTRO STORICO, DUNQUE, PRIVE DI BASOLE O PIASTRELLE IN PIETRA LOCALE

In. 08 EDERA FOTOVOLTAICA

PRINCIPIO DI FUNZIONAMENTO

L'edera fotovoltaica è una tecnologia innovativa che combina la fotosintesi delle piante con la produzione di energia elettrica tramite celle solari integrate. Questo sistema utilizza piante, come l'edera, che sono dotate di celle fotovoltaiche posizionate sulle loro foglie o viti. Le celle fotovoltaiche convertono la luce solare in elettricità, mentre le piante forniscono un effetto di raffrescamento e miglioramento estetico. Il sistema può includere anche tecnologie per raccogliere l'energia generata dalle foglie durante il processo di fotosintesi.

APPLICABILITÀ

L'edera fotovoltaica è applicabile in vari contesti:
Facciate Edilizie: Può essere utilizzata per rivestire edifici e facciate, integrando la produzione di energia nella struttura dell'edificio.
Spazi Pubblici: Adatta per parchi, giardini e aree verdi dove l'estetica e la sostenibilità sono prioritarie.
Ambienti Urbani: Ideale per aree urbane dove si desidera integrare soluzioni verdi con produzione energetica.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Combinando vegetazione e produzione di energia, contribuisce a ridurre l'impronta ecologica e promuove l'uso di energie rinnovabili, Offre un aspetto verde e naturale agli edifici e agli spazi pubblici, migliorando l'estetica e l'integrazione ambientale, Le piante possono contribuire a ridurre la temperatura degli edifici e degli spazi circostanti grazie all'evapotraspirazione.
Svantaggi: La produzione di energia può essere inferiore rispetto ai pannelli solari tradizionali a causa della superficie limitata e della variabilità della luce solare, Richiede cura e manutenzione delle piante per assicurare il funzionamento ottimale delle celle fotovoltaiche e la salute delle piante stesse, L'installazione e la manutenzione di sistemi integrati di edera fotovoltaica possono essere più costosi rispetto ai sistemi fotovoltaici convenzionali.
Rischi: Le condizioni climatiche avverse o problemi di crescita possono influenzare l'efficacia e la salute delle piante, Potenziali rischi legati alla gestione delle piante e all'uso di sostanze chimiche per la cura delle stesse, La combinazione di tecnologia e biologico può presentare sfide di affidabilità e longevità.

SINERGIE E INTERAZIONI

Architettura Verde: Si integra bene con altre tecnologie di architettura verde, come i tetti verdi e le pareti vegetali, per aumentare la sostenibilità degli edifici.
Sistemi di Raccolta dell'Acqua: Può essere combinata con sistemi di raccolta e riuso dell'acqua piovana per migliorare la gestione delle risorse.
Energie Rinnovabili Complementari: Può lavorare in sinergia con altre fonti di energia rinnovabile, come i pannelli solari tradizionali, per ottimizzare la produzione energetica.

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COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
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SPECIFICHE TECNICHE

PUO' ESSERE APPLICATA PER OCCULTARE SOLUZIONI TECNOLOGICHE POCO GRADEVOLI ALLA VISTA, ESPOSTE A SUD PER ACCOGLIERE I RAGGI SOLARI

Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

In. 09 PAVIMENTO FOTOVOLTAICO

PRINCIPIO DI FUNZIONAMENTO

Il pavimento fotovoltaico utilizza pannelli solari integrati nella superficie del pavimento per convertire la luce solare in elettricità. Questi pannelli possono essere realizzati con materiali trasparenti o semi-trasparenti, che permettono alla luce di passare attraverso e colpire le cellule fotovoltaiche sottostanti. I pavimenti fotovoltaici possono essere installati in aree ad alta esposizione solare, come strade, marciapiedi, piazze e aree pedonali, e sono progettati per generare energia rinnovabile direttamente dove viene installato.

APPLICABILITÀ

Il pavimento fotovoltaico è applicabile in vari contesti, tra cui:
Spazi Pubblici: Piazze, marciapiedi e aree pedonali dove si desidera integrare la produzione di energia rinnovabile senza occupare ulteriore spazio.
Aree Commerciali: Zone di ingresso di centri commerciali, stazioni e aeroporti dove il traffico pedonale è intenso e la superficie può essere utilizzata per generare energia.
Infrastrutture di Trasporto: Piste ciclabili e strade con elevata esposizione solare.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Genera energia rinnovabile direttamente dove viene installato, riducendo la dipendenza dalla rete elettrica e sfruttando spazi esistenti, Aiuta a ridurre l'impronta di carbonio degli edifici e delle aree pubbliche tramite l'uso di energia solare, Può essere progettato per adattarsi esteticamente ai contesti urbani e architettonici, migliorando l'aspetto degli spazi pubblici.
Svantaggi: L'installazione di pavimenti fotovoltaici può essere significativamente più costosa rispetto ai pavimenti tradizionali e ai pannelli solari montati su tetti, La superficie dei pavimenti fotovoltaici può essere soggetta a usura e danni, richiedendo manutenzione regolare, L'efficienza di conversione dell'energia può variare a seconda dell'angolo di incidenza della luce solare e della qualità dei materiali utilizzati.
Rischi: I pavimenti fotovoltaici installati su strade o marciapiedi devono essere progettati per garantire la sicurezza dei pedoni e dei veicoli, evitando scivolamenti o danni, La produzione di energia può essere influenzata da condizioni meteorologiche avverse, come pioggia o neve, che possono ridurre la quantità di luce solare disponibile, Potenziali danni da traffico intenso, impatti o vibrazioni che possono compromettere l'efficacia dei pannelli fotovoltaici integrati.

SINERGIE E INTERAZIONI

Può essere integrato con altri sistemi di energia rinnovabile, come pannelli solari tradizionali o turbine eoliche, per ottimizzare la produzione complessiva di energia. L'energia generata può essere immagazzinata in batterie o sistemi di accumulo per un utilizzo successivo o per alimentare altre infrastrutture. Si sposa bene con progetti di architettura sostenibile e design urbano verde, contribuendo alla creazione di ambienti più eco-friendly.

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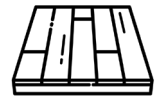

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

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SPECIFICHE TECNICHE

APPLICABILE IN ARCHITETTURE PIU' RECENTI O NELLE TERRAZZE

In. 10 FOTOVOLTAICO E ARREDO URBANO

PRINCIPIO DI FUNZIONAMENTO

Il fotovoltaico applicato all'arredo urbano utilizza pannelli solari integrati in strutture pubbliche per convertire la luce solare in elettricità. Questi pannelli possono essere montati su colonnine di parcheggio, tettoie e pensiline per l'attesa dei bus. L'energia prodotta viene utilizzata per alimentare diverse applicazioni, come l'illuminazione pubblica, i display informativi, e le stazioni di ricarica per veicoli elettrici. I pannelli possono essere integrati nella struttura dell'arredo urbano o installati come componenti aggiuntivi.

APPLICABILITÀ

Il fotovoltaico applicato all'arredo urbano è applicabile in vari contesti:
Colonnine di parcheggio con pannelli solari per alimentare stazioni di ricarica per veicoli elettrici o illuminazione. Strutture coperte per l'attesa dei mezzi pubblici che integrano pannelli solari per alimentare l'illuminazione, display informativi e Wi-Fi pubblico. Strutture che forniscono ombra e riparo, mentre generano energia per alimentare servizi urbani o spazi verdi.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Genera elettricità direttamente sul posto, riducendo la dipendenza dalla rete elettrica e migliorando la sostenibilità delle infrastrutture urbane, Fornisce energia per applicazioni locali come illuminazione e dispositivi informativi, riducendo i costi operativi e migliorando l'efficienza energetica, Integra tecnologie sostenibili nell'arredo urbano, migliorando l'aspetto e la funzionalità degli spazi pubblici.
Svantaggi: I costi iniziali per l'installazione dei pannelli solari e delle strutture possono essere elevati rispetto ai sistemi tradizionali, Richiede manutenzione regolare per garantire il funzionamento ottimale dei pannelli e delle strutture, inclusa la pulizia e la verifica del corretto funzionamento, La produzione di energia dipende dalle condizioni meteorologiche e dall'esposizione al sole, con potenziale variabilità nella quantità di energia prodotta.
Rischi: I pannelli solari e le strutture possono essere soggetti a danni da condizioni climatiche avverse o vandalismo, richiedendo interventi di riparazione, Le strutture devono essere progettate per garantire la sicurezza e la stabilità, evitando rischi per i pedoni e per i veicoli, È necessario pianificare l'integrazione con altri servizi e infrastrutture urbane per evitare interferenze o conflitti.

SINERGIE E INTERAZIONI

L'energia prodotta può alimentare l'illuminazione pubblica, i display informativi e i punti di accesso Wi-Fi, migliorando i servizi urbani. Può essere integrato in reti di energia rinnovabile locali per ottimizzare l'uso dell'energia e migliorare la sostenibilità della rete. L'energia può essere immagazzinata in batterie per un uso successivo, garantendo una fornitura continua anche durante la notte o in giornate nuvolose.

NORMATIVA DI RIFERIMENTO

Direttiva Europea RED II, Decreto Legislativo 199/2021, Decreto Legislativo 210/2021, Delibera ARERA 727/2022/R/eel, Decreto Ministeriale 23 febbraio 2024

DISPOSITIVI PER LA CAPTAZIONE DELL'ENERGIA EOLICA CON VENTO ON-SHORE

recupero ed efficientamento energetico

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

APPLICABILE IN SOLUZIONI AMOVIBILI

Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

L'integrazione del fotovoltaico può essere realizzata attraverso l'installazione su architetture temporanee non soggette a vincoli, a differenza del patrimonio edilizio. Tale approccio consente un'applicazione versatile ed efficace, adattabile a diversi contesti. Di seguito sono riportati alcuni esempi applicativi:

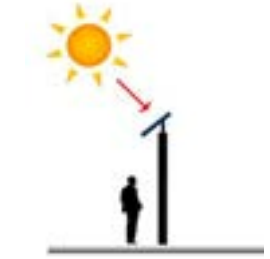
- **Lampioni**
- **Insegne pubblicitarie**
- **Aree di sosta pedonali**
- **Parchi pubblici**
- **Giardini pubblici**
- **Piazze**
- **Chioschi**
- **Aree di passaggio**
- **Parcometri**
- **Coperture** (tunnel, autostrade, banchine, stazioni di rifornimento, stazioni, scuole, magazzini, fermate dei bus, barriere acustiche e antirumore)

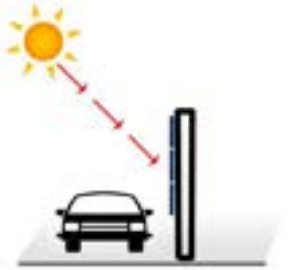
Questi impianti possono essere collocati sopra le strutture esistenti o integrati attraverso una progettazione specifica, sia come sistemi isolati che collegati alla rete elettrica nazionale.

L'applicazione del fotovoltaico in questo modo consente di riqualificare intere aree, rigenerando architetture obsolete o degradate.

Allo stesso tempo, evita l'installazione forzata sui fabbricati, sfruttando elementi mobili del contesto urbano, riducendo così l'impatto paesaggistico, come nel caso dei paesi che fanno parte del Parco delle Madonie.

Valencia, Spagna





In. 11 GREEN SHADES

PRINCIPIO DI FUNZIONAMENTO

Le Green Shades sono tende viventi, ovvero sistemi di schermatura solare che utilizzano piante vive per fornire ombra e isolamento. Questi sistemi integrano la vegetazione in strutture che possono essere installate su finestre, facciate di edifici, balconi e altre superfici. Il principio di funzionamento si basa su:

- **Fotosintesi:** Le piante assorbono la luce solare per la fotosintesi, riducendo così la quantità di calore che entra nell'edificio.
- **Evapotraspirazione:** Le piante rilasciano umidità nell'aria, contribuendo a raffreddare l'ambiente circostante.
- **Isolamento Naturale:** La vegetazione fornisce un ulteriore strato di isolamento termico e acustico.

APPLICABILITÀ

Le tende con vegetazione possono essere applicate in vari contesti, tra cui: Per migliorare il comfort termico e l'estetica. Per migliorare l'efficienza energetica e la sostenibilità ambientale. Per ridurre l'impatto ambientale e promuovere il verde urbano. Per creare oasi verdi e migliorare la qualità dell'aria.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Riduzione dei costi di raffreddamento grazie all'ombreggiamento naturale. Miglioramento del microclima interno e riduzione delle temperature estive. Aggiunta di verde agli edifici, migliorando l'estetica e supportando la biodiversità urbana. Utilizzo di soluzioni naturali per migliorare l'efficienza energetica.
Svantaggi: Le piante richiedono cura e manutenzione regolare, inclusa l'irrigazione e la potatura. Installazione e implementazione possono essere costose. La struttura deve essere in grado di supportare il peso delle piante e dei sistemi di irrigazione.
Rischi: Le piante possono essere suscettibili a malattie e parassiti. L'efficacia dipende dalle condizioni climatiche locali e dalla selezione delle specie vegetali appropriate.

SINERGIE E INTERAZIONI

Le tende con vegetazione possono sinergizzare con altre tecnologie e pratiche sostenibili, tra cui: L'acqua raccolta può essere utilizzata per irrigare le piante. Integrazione con sistemi di controllo automatizzati per l'irrigazione e la gestione della luce. Combinazione con pannelli solari per creare edifici a basso impatto energetico. Utilizzo di materiali da costruzione ecologici e riciclati.

NORMATIVA DI RIFERIMENTO

Direttiva Europea RED II, Decreto Legislativo 199/2021, Decreto Legislativo 210/2021, Delibera ARERA 727/2022/R/eel, Decreto Ministeriale 23 febbraio 2024

DISPOSITIVI PER MIGLIORARE L'OUTDOOR COMFORT

ombreggiamento e uso di sistemi

COMPATIBILITÀ : M - A
REVERSIBILITÀ : A
INVASIVITÀ : B - M
AZIONI
accumula
recupera
equilibra

COLORI COMPATIBILI

VERDE
BIANCO E COLORAZIONI AUTOCTONE

SPECIFICHE TECNICHE

POICHE' SI TRATTA DI UNA STRUTTURA TEMPORANE, QUESTA E' APPLICABILE ANCHE NEI CENTRI STORICI

Compatibile con centri storici: soluzioni adatte a contesti sensibili, con approcci mirati a salvaguardare l'autenticità dell'edificio storico.

Esempi di Green Shades

Valladolid, Spagna

BLUE GREEN ENERGY

Il progetto "Blue Green Energy" rappresenta un significativo passo avanti per Blufi, un pittoresco borgo situato a 800 metri sopra il livello del mare nel cuore delle Madonie, in provincia di Palermo. Blufi, con i suoi circa mille abitanti, è noto per i suoi campi primaverili che si trasformano in un mare di tulipani selvatici rossi, guadagnandosi il soprannome di "piccola Olanda". Nonostante la sua apparenza rurale e distante dalla modernità, Blufi è proiettato verso un futuro sostenibile e innovativo.

L'amministrazione comunale di Blufi ha deciso di abbracciare la proposta di Enel X per fondare la prima Comunità Energetica Rinnovabile intercomunale. Questo progetto coinvolgerà, oltre a Blufi, altri cinque comuni delle Madonie: Bompietro, Castellana Sicula, Geraci Siculo, Petralia Soprana e Petralia Sottana.

L'iniziativa punta a promuovere l'uso di energie rinnovabili, favorendo la produzione e il consumo di energia sostenibile a livello locale. Attraverso la creazione di questa Comunità Energetica Rinnovabile, i comuni partecipanti potranno condividere risorse energetiche, ridurre le emissioni di CO_2 e migliorare la qualità della vita dei loro abitanti. Il progetto "Blue Green Energy" non solo contribuirà alla salvaguardia dell'ambiente, ma rappresenterà anche un modello di sviluppo sostenibile per altre comunità italiane.

Linee Guida

- **incontri informativi regolari:** Organizzare periodiche riunioni informative con i rappresentanti dei comuni esclusi per spiegare i benefici e i progressi delle comunità energetiche. Questi incontri possono includere presentazioni dettagliate, sessioni di domande e risposte, e condivisione di casi di successo.
- **report periodici:** Distribuire report trimestrali o semestrali che illustrino i risultati raggiunti, le sfide superate e le opportunità future. Questi documenti devono essere chiari e accessibili, fornendo dati concreti e storie di impatto positivo.
- **tavoli di lavoro congiunti:** Creare gruppi di lavoro misti, composti da rappresentanti dei comuni partecipanti e dei comuni esclusi, per discutere e sviluppare strategie comuni. Questi tavoli possono affrontare temi specifici come l'efficienza energetica, il finanziamento di progetti e l'innovazione tecnologica.
- **progetti pilota:** Invitarli a partecipare a progetti pilota che dimostrino i vantaggi tangibili delle comunità energetiche. Questi progetti possono fungere da vetrina per mostrare l'impatto positivo sull'economia locale e sull'ambiente.
- **sostegno finanziario:** Offrire incentivi economici o agevolazioni finanziarie ai comuni che decidono di aderire. Questo può includere sovvenzioni per l'installazione di impianti di energia rinnovabile o finanziamenti agevolati per progetti di efficienza energetica.
- **assistenza tecnica e operativa:** Fornire supporto tecnico e operativo per facilitare l'integrazione dei nuovi comuni nelle comunità energetiche. Questo può includere consulenze, formazione del personale e assistenza nella progettazione e implementazione di impianti energetici.
- **programmi di formazione:** Organizzare corsi di formazione per gli amministratori e il personale tecnico dei comuni esclusi, focalizzati sui vantaggi delle energie rinnovabili e sulla gestione delle comunità energetiche.
- **campagne di sensibilizzazione:** Promuovere campagne informative rivolte ai cittadini dei comuni esclusi per aumentare la consapevolezza sui benefici ambientali ed economici delle comunità energetiche.
- **partnership strategiche:** Stabilire collaborazioni con enti sovracomunali, come province e regioni, per promuovere l'adesione dei comuni esclusi. Queste partnership possono fornire ulteriore supporto e risorse per la transizione energetica.
- **valutazione dei risultati:** Implementare un sistema di monitoraggio per valutare l'efficacia delle iniziative di coinvolgimento e apportare eventuali miglioramenti. Questo sistema dovrebbe includere indicatori chiave di performance e feedback continuo dai comuni coinvolti.
- **feedback continuo:** Raccogliere feedback dai comuni esclusi per comprendere le loro esigenze, preoccupazioni e difficoltà nell'adesione alle comunità energetiche. Utilizzare queste informazioni per adattare le strategie e migliorare l'approccio di coinvolgimento.
- **diffusione di buone pratiche:** Condividere storie di successo e case study di comuni che hanno beneficiato dall'adesione alle comunità energetiche. Questi esempi possono motivare e incoraggiare i comuni esclusi a partecipare.
- **visite guidate:** Organizzare visite presso i comuni già aderenti alle comunità energetiche per mostrare direttamente i risultati ottenuti e facilitare lo scambio di esperienze.

Benefici del principio di inclusività

L'inclusività nelle comunità energetiche offre numerosi vantaggi, migliorando qualità della vita, economia locale e ambiente. La collaborazione tra comuni consente di ottimizzare risorse tecniche e operative, ridurre sprechi e duplicazioni, condividere infrastrutture e abbattere costi. Comunità più inclusive accedono con maggiore facilità a finanziamenti per progetti di energia rinnovabile e miglio-

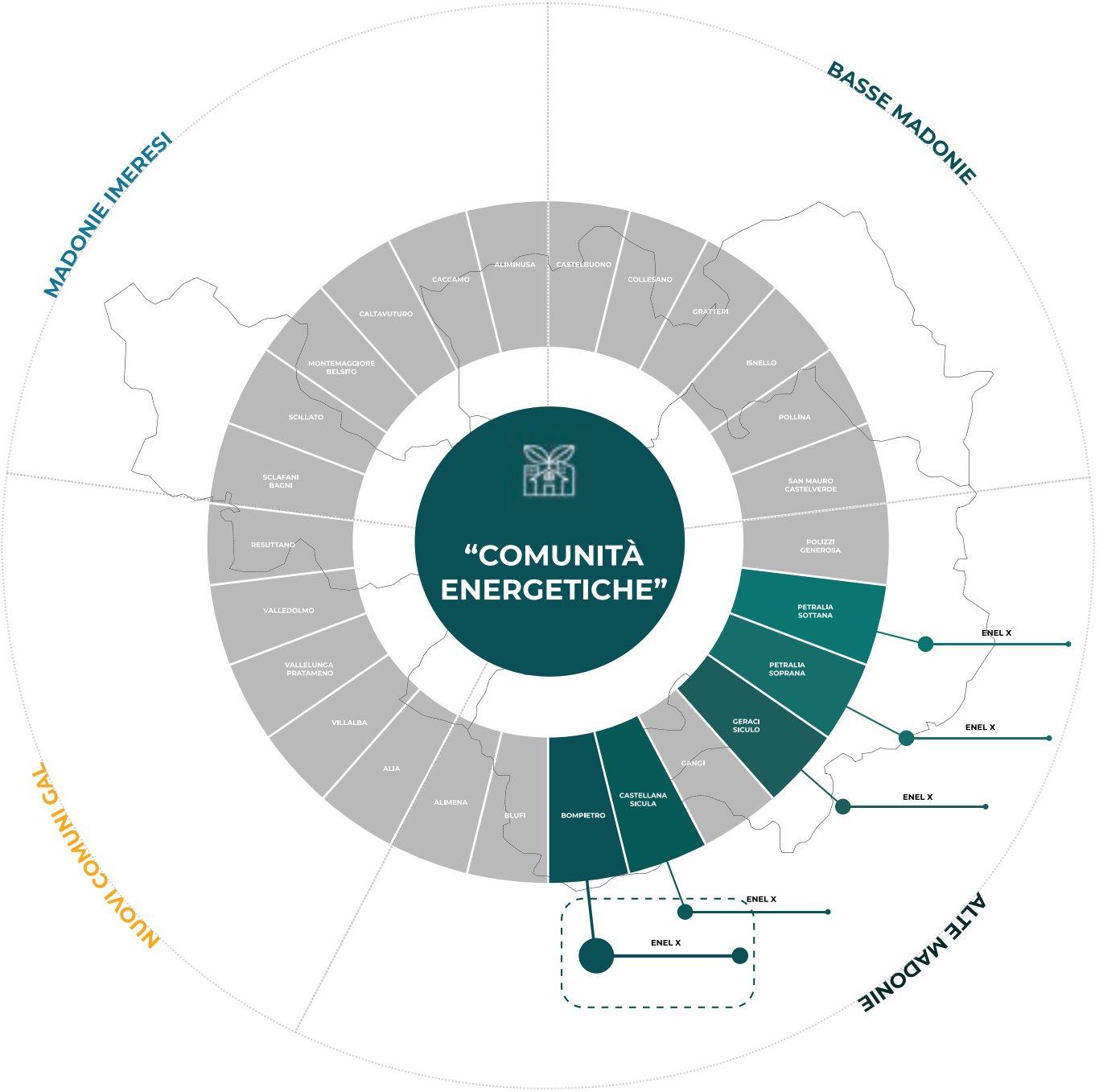
ramento dell'efficienza energetica, stimolando lo sviluppo economico locale.

Una gestione integrata garantisce un servizio più omogeneo e affidabile, facilita l'adozione di tecnologie innovative e potenzia la resilienza delle infrastrutture. Dal punto di vista ambientale, l'uso di energie rinnovabili e pratiche sostenibili riduce le emissioni di CO_2, protegge le risorse naturali e migliora la qualità dell'aria e dell'acqua.

L'inclusività favorisce la partecipazione attiva dei cittadini, aumentando consapevolezza e senso di comunità. Inoltre, crea opportunità lavorative nel settore delle energie rinnovabili e dell'efficienza energetica, stimolando l'economia locale. La collaborazione tra comuni agevola lo scambio di competenze, la formazione e l'adozione di infrastrutture moderne ed efficienti.

Infine, le comunità energetiche inclusive rafforzano le relazioni intercomunali, promuovendo solidarietà e adattabilità ai cambiamenti, in un modello sostenibile che beneficia sia i partecipanti sia il territorio circostante.

COMUNI CONVOLTI	
ALTE MADONIE	5/9
BASSE MADONIE	0/6
MADONIE IMERESI	0/6
	5/21
COLLABORAZIONE	5/26
% COMUNI COINVOLTI	**19,23%**



Nonostante questi punti critici, le comunità energetiche rappresentano un'importante opportunità per la transizione energetica e per lo sviluppo sostenibile dei territori. Con il continuo sviluppo di modelli di business efficaci, la semplificazione della normativa e l'aumento della consapevolezza, le comunità energetiche potranno diffondersi sempre più ampiamente, contribuendo alla costruzione di un futuro energetico più sostenibile e inclusivo.

FATTORI TRAINANTI

Transizione energetica: Le comunità energetiche rappresentano un modello innovativo per la produzione e il consumo di energia rinnovabile a livello locale, contribuendo alla decarbonizzazione del sistema energetico e alla lotta ai cambiamenti climatici.

Riduzione dei costi energetici: Le comunità energetiche possono permettere ai cittadini di risparmiare sulle bollette energetiche, acquistando e consumando energia prodotta localmente a prezzi più bassi rispetto a quelli del mercato tradizionale.

Autonomia energetica: Le comunità energetiche aumentano l'autonomia energetica dei territori, riducendo la dipendenza dai combustibili fossili e dalle importazioni di energia.

Sviluppo locale: Le comunità energetiche possono creare opportunità di lavoro e di sviluppo economico nei territori, stimolando la crescita di filiere produttive legate alle energie rinnovabili e all'efficienza energetica.

Coesione sociale: Le comunità energetiche possono favorire la coesione sociale e la partecipazione attiva dei cittadini alla gestione dell'energia, promuovendo un senso di appartenenza e di responsabilità collettiva.

PUNTI CRITICI

Complessità normativa: La normativa per la costituzione e la gestione delle comunità energetiche è ancora in evoluzione e può risultare complessa e di difficile interpretazione.

Barriere burocratiche: Le procedure per l'ottenimento delle autorizzazioni e degli incentivi necessari alla realizzazione di progetti di comunità energetica possono essere lunghe e complesse.

Mancanza di competenze: La gestione di una comunità energetica richiede competenze specifiche in materia di energia, finanza e gestione, che non sempre sono facilmente reperibili nei territori.

Difficoltà di finanziamento: L'accesso al credito per la realizzazione di progetti di comunità energetica può essere un ostacolo, soprattutto per le piccole comunità o per i progetti di dimensioni ridotte.

Mancanza di consapevolezza: Non tutti i cittadini sono a conoscenza dei benefici delle comunità energetiche e di come partecipare attivamente a questo modello.

VALUTAZIONE DEI CRITERI SMART PER IL MIGLIORAMENTO DEL DECORO URBANO E PROPOSTE DI INTERVENTO

Alimena; ©Luisa Lombardo, 2023

12.1 - LA DIAGNOSI DEL DECORO URBANO

Prima di avviare una diagnosi del decoro urbano, è importante stabilire chiaramente gli obiettivi del progetto. Cosa si desidera raggiungere?

Gli obiettivi potrebbero includere il miglioramento dell'aspetto estetico, l'aumento dell'attrattività turistica, l'ottimizzazione della vivibilità o la promozione delle attività commerciali locali.

1. Raccolta di Dati e Analisi

a. Ispezione visiva
Effettuare un'ispezione visiva completa del centro urbano. Osservare l'aspetto degli edifici, delle strade, delle piazze e degli spazi pubblici. Registrare i punti critici, come aree degradate, graffiti o segni di abbandono.

b. Interviste e coinvolgimento della comunità
Coinvolgere la comunità locale, compresi residenti, imprenditori e stakeholder, in interviste o incontri pubblici. Raccogliere feedback, suggerimenti e preoccupazioni riguardo al decoro urbano e all'outdoor comfort.

c. Valutazione dell'infrastruttura
Valutare lo stato delle infrastrutture, inclusi marciapiedi, illuminazione pubblica, arredi urbani, segnaletica stradale e parcheggi. Identificare le aree che richiedono manutenzione o miglioramenti.

d. Analisi della storia e della cultura locale
Esaminare la storia e la cultura del piccolo centro. Questo aiuta a identificare elementi architettonici, culturali o storici che possono essere valorizzati o ripristinati.

2. Analisi dei Risultati
Dopo la raccolta dei dati, analizzare le informazioni raccolte per identificare i principali problemi di decoro urbano e le opportunità di miglioramento. Questa analisi dovrebbe includere:

- identificazione delle aree critiche che richiedono interventi immediati.
- valutazione delle esigenze di manutenzione e ripristino dell'infrastruttura.
- identificazione delle risorse disponibili e delle possibili fonti di finanziamento.
- considerazione delle opportunità per la promozione del patrimonio culturale locale.

3. Sviluppo di Soluzioni
Una volta identificati i problemi e le opportunità, sviluppare soluzioni concrete per migliorare il decoro urbano. Queste soluzioni potrebbero includere:

- restauro e manutenzione degli edifici storici.
- riqualificazione degli spazi pubblici, inclusi parchi, piazze e strade.
- installazione di arredi urbani, come panchine, cestini, illuminazione pubblica e segnaletica.
- promozione di iniziative culturali e artistiche locali.
- coinvolgimento di artisti murali per decorare le pareti degli edifici.

4. Pianificazione e Implementazione
Una volta sviluppate le soluzioni, pianificare e avviare il processo di implementazione. Questo potrebbe richiedere il coinvolgimento di professionisti dell'architettura, del restauro e del design urbano, nonché la gestione di risorse e finanziamenti.

5. Monitoraggio e Valutazione
Dopo l'implementazione delle soluzioni, monitorare costantemente il decoro urbano per assicurarsi che gli obiettivi siano stati raggiunti. Raccogliere feedback dalla comunità e apportare eventuali correzioni o miglioramenti necessari.

6. Comunicazione e Promozione
Informare la comunità e i visitatori sulle migliorie apportate al centro urbano. Questo contribuirà a promuovere l'identità locale e ad attirare visitatori, favorendo lo sviluppo economico.

In conclusione, la diagnosi del decoro urbano è fondamentale per il recupero e la valorizzazione dei piccoli centri urbani. Un approccio olistico che coinvolge la comunità, valuta le esigenze e sviluppa soluzioni pratiche può migliorare notevolmente le condizioni di "outdoor comfort", rendendo il centro urbano più attraente e vivibile, promuovendo il turismo locale e stimolando lo sviluppo economico.

12.2 - PROCEDURE PER MIGLIORARE IL DECORO URBANO

Migliorare il decoro urbano di un piccolo centro italiano richiede una serie di procedure e interventi coordinati che coinvolgono sia le autorità locali che la comunità.

Di seguito sono elencate le procedure necessarie per migliorare il decoro urbano, insieme alle pratiche pubbliche che possono essere adottate e il ruolo del tecnico nell'intero processo:

- **analisi del contesto:** La prima fase consiste nell'analizzare il contesto urbano. Questo può includere la valutazione delle infrastrutture esistenti, l'identificazione delle aree degradate e la comprensione delle esigenze della comunità.
- **coinvolgimento della comunità:** Coinvolgere attivamente la comunità locale è fondamentale. Attraverso incontri pubblici, sondaggi o gruppi di lavoro, raccogliere feedback, suggerimenti e idee dalla popolazione per capire quali sono le priorità in termini di decoro urbano.
- **elaborazione di un piano di miglioramento:** Basandosi sull'analisi del contesto e sui contributi della comunità, sviluppare un piano di miglioramento del decoro urbano. Questo piano dovrebbe definire obiettivi chiari e identificare le azioni necessarie.
- **pianificazione e progettazione:** Coinvolgere professionisti come architetti, urbanisti e ingegneri per pianificare e progettare le modifiche necessarie. Queste modifiche potrebbero includere il restauro di edifici storici, la creazione di spazi pubblici attraenti, il miglioramento dell'illuminazione, ecc.
- **autorizzazioni e finanziamenti:** Ottenere le autorizzazioni necessarie per le modifiche proposte e cercare fonti di finanziamento, che potrebbero includere fondi pubblici, sovvenzioni, sponsorizzazioni o investimenti privati.
- **implementazione:** Portare avanti il piano di miglioramento, garantendo la corretta esecuzione delle modifiche pianificate. Questa fase richiede una stretta collaborazione tra tecnici, imprese edili e operatori locali.
- **manutenzione e gestione:** Una volta completate le modifiche, è importante pianificare la manutenzione regolare per garantire che il decoro urbano rimanga attraente nel tempo. Questa manutenzione dovrebbe coinvolgere sia le autorità locali che la comunità.

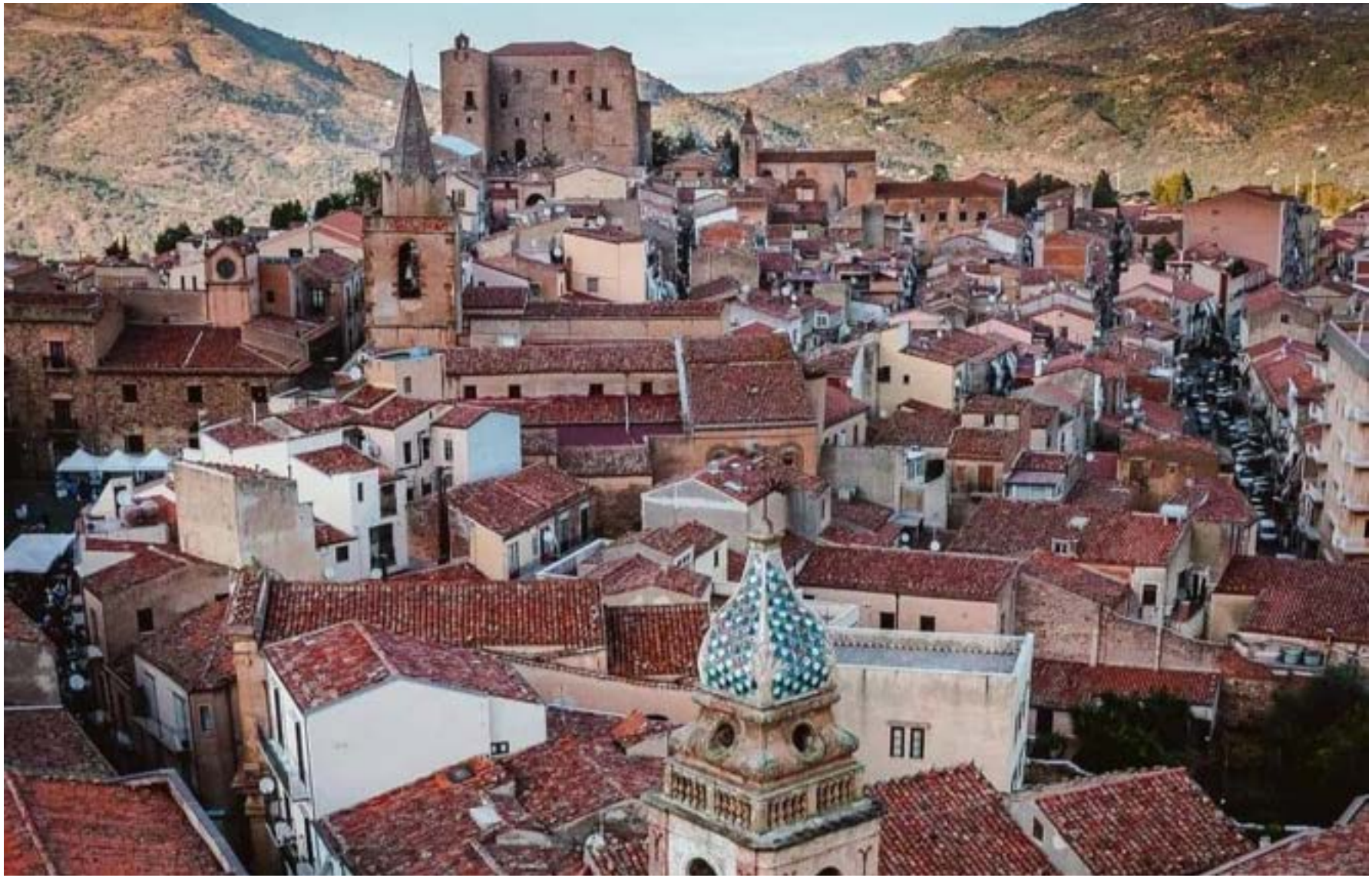
Pratiche pubbliche per migliorare il decoro urbano

- **restauro di edifici storici:** Ripristinare edifici storici o caratteristici per preservare l'identità del centro.
- **creazione di spazi pubblici:** Realizzare nuovi parchi, piazze o aree verdi che offrano luoghi di aggregazione e svago per i residenti.
- **miglioramento dell'illuminazione:** Installare illuminazione pubblica efficace per migliorare la sicurezza e l'aspetto notturno del centro.
- **arredo urbano:** Migliorare l'arredo urbano, inclusi panchine, cestini, fioriere e segnaletica.
- **promozione culturale ed eventi:** Organizzare eventi culturali, mostre o manifestazioni per animare il centro e attrarre visitatori.
- **programmi di pulizia e decoro urbano:** Istituire programmi di pulizia delle strade e decoro urbano per mantenere l'area in uno stato ottimale.

Il Ruolo del Tecnico

La figura del tecnico, che potrebbe essere un architetto, un urbanista o un ingegnere, svolge un ruolo chiave nel processo di miglioramento del decoro urbano. Le responsabilità del tecnico includono:

- collaborare con gli amministratori locali e la comunità per comprendere le esigenze e le aspettative;
- progettare modifiche mirate che rispettino l'identità e la storia del centro;
- coordinare con altri professionisti e imprese per l'implementazione;
- garantire che i progetti siano realizzati in conformità con le normative locali;
- fornire input tecnico per la manutenzione a lungo termine delle modifiche.



Castelbuono; ©Filippo Barbaria, 2023

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In. 01 - Rimozione dei cavi aerei
In. 02 - Illuminazione LED
In. 03 - Pareti verdi
In. 04 - Pluviali, grondaie e canalette
In. 05 - Dissuasori per volatili
In. 06 - Arredo urbano
In. 07 - Bocchette d'aria in pietra locale

LEGENDA ICONE

Ambito urbano

Ambito residenziale

Sistemi per occultare presidi tecnologici

Sistemi di efficientamento energetico

Sistemi di rinverdimento

Sistemi per allontanare fauna

Sistemi di arredo urbano

Sistemi per camuffare la tecnologia per la ventilazione

In. 01 RIMOZIONE DEI CAVI AEREI

PRINCIPIO DI FUNZIONAMENTO

Le tecnologie per la rimozione dei cavi aerei e la gestione sotterranea dei fili elettrici mirano a trasferire le infrastrutture di distribuzione dell'energia elettrica dalle linee aeree a soluzioni sotterranee o integrate. Questo processo coinvolge l'installazione di cavi elettrici sotterranei, tubazioni e condotti che consentono di trasportare l'elettricità senza l'uso di pali e fili aerei visibili. Altre tecnologie comprendono l'uso di cavi aerei più sottili e meno invasivi o sistemi di incapsulamento estetico.

APPLICABILITÀ

Le tecnologie per la rimozione dei cavi aerei sono applicabili in diversi contesti:
Trasferimento dei cavi elettrici dalle linee aeree a quelle sotterranee per migliorare l'aspetto estetico delle città e ridurre il rischio di interruzioni del servizio dovute a condizioni meteorologiche avverse. Interventi in aree residenziali per aumentare la sicurezza, la bellezza del paesaggio e facilitare le attività di manutenzione e ristrutturazione. Nascondere i cavi aerei in aree turistiche e storiche per preservare il valore estetico e culturale degli ambienti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Elimina il disordine visivo creato dai cavi aerei e migliora l'aspetto estetico delle aree urbane e residenziali, Riduce il rischio di incidenti causati da cavi aerei, come cortocircuiti o danni da vento e tempesta, Le linee sotterranee sono meno soggette a danni ambientali e richiedono meno manutenzione rispetto ai cavi aerei.
Svantaggi: L'installazione di cavi sotterranei può essere significativamente più costosa rispetto alla manutenzione dei cavi aerei, sia per i materiali che per le operazioni di scavo e posa, Sebbene richiedano meno manutenzione, i cavi sotterranei possono essere più complessi e costosi da riparare in caso di guasto, L'installazione o la ristrutturazione per spostare i cavi può causare interruzioni temporanee del servizio e disagi durante i lavori.
Rischi: Il processo di scavo e posa può danneggiare altre infrastrutture sotterranee come tubature e cavi di comunicazione, I cavi sotterranei possono essere vulnerabili a problemi di allagamento o infiltrazioni d'acqua, che possono comprometterne l'integrità, Anche se sotterranei, i cavi e le strutture possono essere soggetti a furti o atti di vandalismo se non adeguatamente protetti.

SINERGIE E INTERAZIONI

Si integra bene con progetti di pianificazione urbanistica che mirano a migliorare l'estetica e la funzionalità delle aree urbane. Può lavorare in sinergia con le tecnologie smart grid per migliorare l'efficienza della distribuzione energetica e monitorare lo stato delle reti. L'uso di tecnologie di rilevamento avanzate può facilitare la gestione e la manutenzione dei cavi sotterranei, riducendo i tempi di risposta in caso di problemi.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali

PREVENZIONE IMPATTO PAESAGGISTICO

mitigazione della tecnologia

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI nasconde

COLORI COMPATIBILI

COTTO
GRIGIO CANNA DI FUCILE

SPECIFICHE TECNICHE

APPLICABILE IN TUTTI I CONTESTI URBANI, MA ANCHE ALLA SCALA DELL'EDIFICIO

In. 02 ILLUMINAZIONE LED

PRINCIPIO DI FUNZIONAMENTO

L'illuminazione LED si basa su diodi che emettono luce quando una corrente elettrica passa attraverso di essi. A differenza delle lampadine tradizionali, i LED non utilizzano filamenti o gas, ma una tecnologia a semiconduttore che produce luce in modo più efficiente e duraturo. I LED convertono la maggior parte dell'energia elettrica in luce visibile, riducendo il calore prodotto e migliorando l'efficienza complessiva.

APPLICABILITÀ

L'illuminazione LED può essere applicata in una vasta gamma di contesti: Illuminazione pubblica per strade, parchi e piazze, migliorando la visibilità e la sicurezza. Illuminazione interna ed esterna per uffici, abitazioni e spazi commerciali, offrendo soluzioni versatili e a basso consumo energetico. Illuminazione per stazioni ferroviarie, aeroporti, e fermate dei mezzi pubblici, migliorando l'efficienza energetica e la visibilità per i passeggeri. Illuminazione per display pubblicitari, insegne e decorazioni, grazie alla flessibilità e alla varietà di design.

VANTAGGI / SVANTAGGI / RISCHI

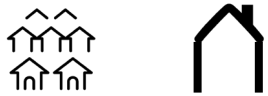
Vantaggi: Sono molto più efficienti rispetto alle lampadine tradizionali, consumando fino all'80% in meno di energia e riducendo i costi delle bollette elettriche, Hanno una vita utile molto più lunga, fino a 25.000-50.000 ore, riducendo la frequenza di sostituzione e i costi di manutenzione, Producono poco calore rispetto alle lampadine a incandescenza e fluorescenza, migliorando la sicurezza e riducendo i costi di raffreddamento, Offrono un controllo preciso della luminosità e del colore, e possono essere facilmente dimmerabili o programmabili.
Svantaggi: L'investimento iniziale per l'acquisto e l'installazione dei LED può essere più elevato rispetto alle soluzioni di illuminazione tradizionali, sebbene i risparmi energetici compensino questo costo nel tempo, Alcuni LED possono produrre una luce che è percepita come troppo fredda o sgradevole se non sono ben progettati o se non offrono regolazioni adeguate, Alcuni LED possono emettere un flicker impercettibile che può causare fastidi visivi o problemi di salute per alcune persone.
Rischi: Se non sono adeguatamente dissipati possono surriscaldarsi e compromettere la loro durata, Alcuni possono generare interferenze elettromagnetiche, Contengono materiali come il piombo e il rame che devono essere smaltiti correttamente per evitare impatti ambientali negativi.

SINERGIE E INTERAZIONI

Possono essere integrati in sistemi di automazione domestica o urbana per ottimizzare l'uso della luce e migliorare l'efficienza energetica attraverso la programmazione e i sensori di movimento. Si combinano bene con fonti di energia rinnovabile, come pannelli solari, per ridurre ulteriormente i costi energetici e aumentare la sostenibilità. Possono essere utilizzati insieme a tecnologie smart per creare soluzioni di illuminazione intelligenti che rispondono ai cambiamenti ambientali e alle esigenze degli utenti.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali



DISPOSITIVI PER GARANTIRE IL RISPARMIO ENERGETICO

efficientamento energetico

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI illumina
risparmia

COLORI COMPATIBILI

LUCE FREDDA O CALDA

SPECIFICHE TECNICHE

APPLICABILE NELL'IMPIANTO DI ILLUMINAZIONE URBANA E PUBBLICA, MA ANCHE PRIVATA.

3000K: LUCE CALDA, PER AMBIENTI ACCOGLIENTI E RILASSANTI.
4000K: LUCE NEUTRA, PER UFFICI E SPAZI DI LAVORO.
5000K - 6500K: LUCE FREDDA, PER AMBIENTI COMMERCIALI.

Alberobello, Puglia

Matera, Basilicata

Rocca Imperiale Marina, Basilicata

Geraci Siculo, Palermo

Isnello, Palermo

Collesano, Palermo

In. 03 PARETI VERDI

PRINCIPIO DI FUNZIONAMENTO

Le pareti verdi, o “pareti vegetali”, sono strutture verticali rivestite di piante che possono essere installate sia all’interno che all’esterno degli edifici. Queste pareti possono essere realizzate con diversi sistemi, come il sistema a moduli prefabbricati, il sistema a reticolo, o il sistema di pacciamatura. Le piante sono coltivate in substrati specifici o in contenitori integrati nella struttura della parete. Le pareti verdi svolgono funzioni estetiche, ambientali e di isolamento, migliorando la qualità dell’aria e l’efficienza energetica degli edifici.

APPLICABILITÀ

Le pareti verdi possono essere applicate in diversi contesti: Per migliorare l’estetica, aumentare la sostenibilità e contribuire al benessere degli occupanti, Parchi, piazze e facciate di edifici pubblici per creare ambienti più verdi e accoglienti, Per integrare aree verdi nei contesti urbani densamente popolati, migliorando la qualità dell’aria e offrendo spazi di relax.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Migliorano la qualità dell’aria riducendo l’inquinamento e aumentando l’ossigenazione. Inoltre, aiutano a ridurre l’effetto isola di calore urbano e forniscono isolamento termico, Aggiungono valore estetico e migliorano l’aspetto visivo degli edifici e degli spazi pubblici, Possono contribuire a migliorare l’efficienza energetica degli edifici offrendo un isolamento naturale, riducendo i costi di riscaldamento e raffreddamento, Possono contribuire al benessere degli occupanti creando ambienti più piacevoli e riducendo lo stress.

Svantaggi: I costi iniziali per la progettazione, installazione e manutenzione delle pareti verdi possono essere elevati rispetto alle soluzioni tradizionali, Richiedono manutenzione regolare per garantire la salute delle piante, compresa l’irrigazione, la potatura e il controllo delle malattie, L’installazione di pareti verdi richiede uno spazio adeguato e potrebbe non essere adatta per tutte le strutture o contesti.

Rischi: Se non progettate e installate correttamente, le pareti verdi possono causare danni alla struttura dell’edificio a causa dell’umidità e del peso delle piante, Il sistema di irrigazione deve essere ben progettato per evitare problemi come l’accumulo di acqua e la crescita di muffe, Le piante possono essere soggette a parassiti e malattie che necessitano di gestione e trattamenti specifici.

SINERGIE E INTERAZIONI

Si integra bene con altri elementi di architettura sostenibile, come i tetti verdi e i sistemi di raccolta dell’acqua piovana, per migliorare la sostenibilità globale dell’edificio.

Combinata con sistemi di ventilazione naturale o meccanica, può migliorare l’efficienza energetica e la qualità dell’aria interna.

Può essere utilizzata nei progetti di recupero e riqualificazione urbana per ripristinare aree degradate e migliorare il paesaggio urbano.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali

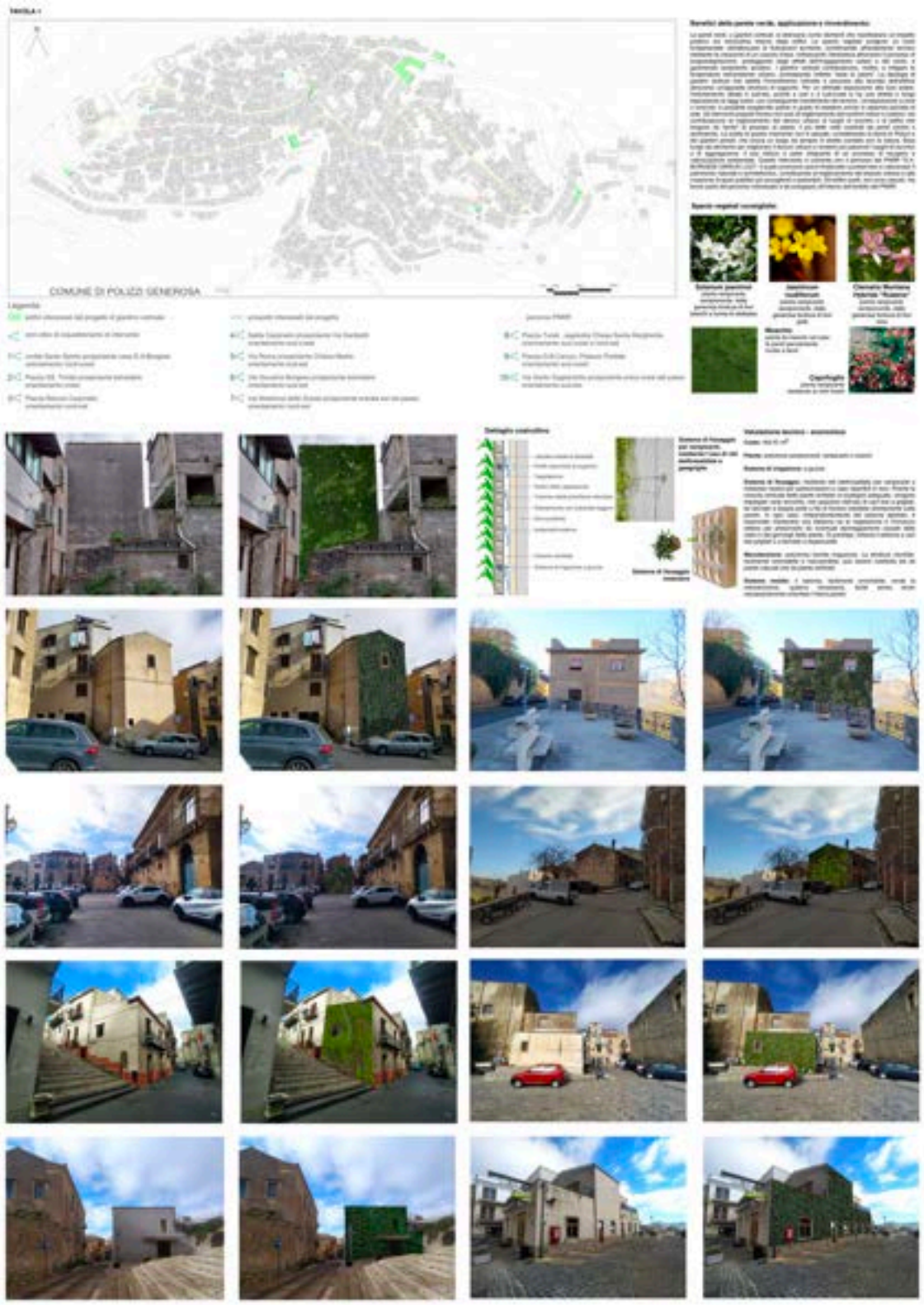
DISPOSITIVI PERIL MIGLIORAMENTO DEL DECORO URBANO

decoro urbano e occultazione di

COMPATIBILITÀ : M - B
REVERSIBILITÀ : A
INVASIVITÀ : A - M
AZIONI occulta
mette a dimora
migliora il comfort

SPECIFICHE TECNICHE

APPLICABILE LUNGO LE PARETI DEGLI EDIFICI INTONACATI PER GARANTIRE SIA DECORO URBANO CHE L’INDOOR E L’OUTDOOR COMFORT



Nell'ambito del bando Democrazia Partecipata del Comune di Polizzi Generosa, si è proposta concretamente la possibilità di applicare delle pareti verdi nel centro abitato. Questa iniziativa mira a integrare elementi di sostenibilità e decoro urbano attraverso l'installazione di pareti ventilate addossate agli edifici.

La selezione delle aree ha previsto un'analisi approfondita delle architetture prospicienti lungo il percorso del PNRR G.A. Borgese Genius Loci, con l'obiettivo di valorizzare e promuovere il comune attraverso un approccio innovativo e rispettoso dell'ambiente.

Le pareti verdi, come descritto nella scheda di approfondimento, offrono molteplici benefici: migliorano il decoro urbano, introducono spazi verdi nei centri storici ormai per lo più privi di vegetazione, e contrastano l'impatto visivo dell'architettura locale predominante. Questi interventi non solo abbelliscono gli spazi pubblici, ma promuovono anche il benessere della comunità. Le pareti verdi aiutano a mitigare le temperature estreme, offrendo un isolamento termico naturale che risulta efficace sia durante l'estate che l'inverno.

Questa proposta rientra a pieno titolo nell'Atlante delle Buone Pratiche del Comune di Polizzi Generosa, in quanto rappresenta un esempio di efficientamento energetico e decoro urbano, ma anche un modello di partecipazione attiva dei cittadini. Coinvolgendo la popolazione nella formulazione e realizzazione di progetti, si promuove un dialogo costruttivo tra amministrazione e cittadini, favorendo l'adozione di idee innovative e soluzioni condivise. L'implementazione delle pareti verdi può essere estesa ad altri contesti urbani, dimostrando come i processi partecipativi possano generare valore aggiunto e creare un ambiente più vivibile e sostenibile. Questa pratica sottolinea l'importanza di coinvolgere la comunità nella pianificazione urbana, stimolando la creazione di spazi verdi che migliorano la qualità della vita e promuovono una gestione ambientale consapevole.

In. 04 PLUVIALI, GRONDAIE E CANALETTE

PRINCIPIO DI FUNZIONAMENTO

I pluviali, le grondaie e le canalette sono tradizionalmente utilizzati per la raccolta e il drenaggio dell'acqua piovana dagli edifici. Tuttavia, possono essere anche progettati e utilizzati per occultare impianti tecnologici come cavi elettrici, tubazioni per la climatizzazione, condotti di ventilazione, e altri sistemi di servizio. L'integrazione di questi impianti all'interno delle strutture di drenaggio permette di mantenere un'estetica pulita e ordinata, proteggendo allo stesso tempo i componenti tecnologici dagli agenti atmosferici.

APPLICABILITÀ

L'occultamento degli impianti tecnologici attraverso pluviali, grondaie e canalette è applicabile in vari contesti: Per nascondere cavi, tubazioni e condotti in modo esteticamente gradevole. Scuole, ospedali e uffici governativi dove l'estetica e la sicurezza sono prioritarie. Aree pubbliche come parchi, piazze e strade dove l'integrazione dei sistemi tecnologici con il drenaggio delle acque piovane è necessaria per mantenere l'ordine visivo e funzionale.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Nasconde gli impianti tecnologici mantenendo un aspetto pulito e ordinato delle facciate degli edifici e degli spazi esterni, Protegge i componenti tecnologici dagli agenti atmosferici, riducendo il rischio di danni e migliorando la longevità dei sistemi, Utilizza in modo efficiente lo spazio esistente senza necessità di installazioni aggiuntive o visibili.
Svantaggi: L'integrazione di impianti tecnologici con i sistemi di drenaggio può comportare costi aggiuntivi per la progettazione e l'installazione, La manutenzione può diventare più complessa poiché i componenti tecnologici sono nascosti e integrati nelle strutture di drenaggio, Gli impianti occultati possono essere meno accessibili per interventi di riparazione o aggiornamento, richiedendo procedure più elaborate.
Rischi: Le grondaie e le canalette potrebbero intasarsi se non correttamente progettate, causando problemi di drenaggio e potenziali danni agli impianti tecnologici nascosti, Se non adeguatamente ventilati, i componenti tecnologici possono essere soggetti a problemi di condensa e umidità, compromettendo il loro funzionamento, Durante l'integrazione dei sistemi, potrebbero verificarsi danni alle strutture di drenaggio o agli impianti tecnologici stessi.

SINERGIE E INTERAZIONI

Possono essere combinati con sistemi di drenaggio avanzati che includono filtri e trappole per detriti per prevenire intasamenti e garantire un funzionamento ottimale. Si integrano bene con progetti di architettura sostenibile, migliorando l'efficienza energetica e l'estetica degli edifici e degli spazi urbani. Possono essere parte di un sistema di edifici intelligenti, dove i componenti tecnologici sono gestiti e monitorati attraverso sistemi di automazione avanzati.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali

DISPOSITIVI PER NASCONDERE ELEMENTI TECNOLOGICI CHE DISTURBANO L'ARCHITETTURA LOCALE

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI nasconde

COLORI COMPATIBILI

CORTEN
GRIGIO CANNA DI FUCILE

SPECIFICHE TECNICHE

LA VERSATILITÀ DELLE APPLICAZIONI PRESENTI IN COMMERCIO CONSENTE LA FATTIBILITÀ DELL'INTERVENTO, TUTTAVIA, È OPPORTUNO PRECISARE CHE QUESTO TIPO DI APPLICAZIONI DEVONO TENER CONTO SEMPRE E COMUNQUE DELL'ARCHITETTURA LOCALE IN QUANTO PRESIDIO E NON COME ELEMENTO DI DISTURBO VISIVO.

Alimena, Palermo, Sicilia

Matera, Basilicata

Segesta, Trapani, Sicilia

In. 05 DISSUASORI PER VOLATILI

PRINCIPIO DI FUNZIONAMENTO

I dissuasori per volatili sono dispositivi progettati per prevenire l'atterraggio, la nidificazione e la permanenza di uccelli su edifici, monumenti, e altre strutture. Questi dispositivi funzionano attraverso diversi meccanismi che includono metodi fisici, visivi, sonori, e chimici per scoraggiare i volatili senza causare loro danni. I più comuni includono punte, reti, fili tesi, repellenti visivi come nastri riflettenti o sagome di predatori, e sistemi sonori che emettono suoni sgradevoli per gli uccelli.

APPLICABILITÀ

I dissuasori per volatili possono essere applicati in vari contesti: Per evitare che gli uccelli si posino su tetti, balconi, grondaie e finestre, prevenendo danni estetici e strutturali, Proteggere monumenti e edifici storici dagli escrementi degli uccelli e dalla nidificazione, Parchi, piazze, stazioni ferroviarie, e aeroporti dove la presenza di volatili può rappresentare un problema di pulizia e sicurezza, Proteggere colture agricole, impianti industriali e depositi di cibo dagli uccelli.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Prevengono danni causati dagli escrementi degli uccelli, che possono essere corrosivi e difficili da pulire, Mantengono le aree pubbliche e private pulite e sicure, riducendo i rischi sanitari associati agli escrementi di uccelli, Molti dissuasori sono progettati per essere ecologici e non letali, rispettando la fauna selvatica.

Svantaggi: L'installazione di sistemi di dissuasione può comportare un investimento iniziale significativo, a seconda del tipo e della scala del sistema, Alcuni dissuasori richiedono manutenzione regolare per essere efficaci, come la pulizia delle punte o la sostituzione di componenti usurati, L'efficacia dei dissuasori può variare a seconda delle specie di uccelli e della configurazione dell'area protetta.

Rischi: Alcuni dissuasori possono essere visivamente poco gradevoli e interferire con l'estetica delle strutture, Sebbene progettati per essere non letali, c'è il rischio che alcuni dissuasori possano causare danni accidentali agli uccelli se non correttamente installati, Alcuni uccelli possono adattarsi ai dissuasori nel tempo, riducendo l'efficacia delle misure adottate.

SINERGIE E INTERAZIONI

Possono essere combinati con altre misure di gestione della fauna selvatica, come i programmi di cattura e rilascio o la modifica degli habitat, per una protezione più efficace. L'uso di tecnologie di monitoraggio come telecamere e sensori può aiutare a valutare l'efficacia dei dissuasori e a pianificare interventi mirati. L'integrazione dei dissuasori con il design architettonico può minimizzare l'impatto visivo e migliorare l'estetica delle strutture.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali

DISPOSITIVI PER MITIGARE LA FORMAZIONE DI NIDI SUGLI EDIFICI

COMPATIBILITÀ : M - A
REVERSIBILITÀ : A
INVASIVITÀ : M - A
AZIONI protegge

COLORI COMPATIBILI

CORTEN
GRIGIO CANNA DI FUCILE

SPECIFICHE TECNICHE

E' CONSIGLIABILE APPLICARLO SE SOLO SE IN PRESENZA DI FAUNA PARTICOLARMENTE

Esempi di applicazione dissuasori per volatili

Magenta, Provincia di Milano

Casorzo, Provincia di Asti

Vho, Provincia di Alessandria

Tortona, Provincia di Alessandria

Cosenza, Calabria

Lecce, Puglia

In. 06 ARREDO URBANO

PRINCIPIO DI FUNZIONAMENTO

L'arredo urbano in aree storiche deve essere progettato con attenzione per rispettare e valorizzare l'architettura esistente e il contesto culturale. Questo richiede l'uso di materiali, colori, forme e stili che si integrino armoniosamente con l'ambiente storico. Le soluzioni possono includere pavimentazioni, illuminazione, panchine, cestini, segnaletica e altri elementi urbani progettati per essere funzionali, estetici e rispettosi del patrimonio storico.

APPLICABILITÀ

L'arredo urbano storico può essere applicato in vari contesti: Progetti di riqualificazione per piazze, strade, e vicoli nei centri storici delle città, Miglioramento degli spazi pubblici in zone con alta affluenza turistica per creare un ambiente accogliente e culturalmente ricco, Integrazione di arredi che rispettano l'architettura e lo stile delle abitazioni storiche, Parchi, giardini, e aree di sosta in quartieri storici per offrire spazi verdi e aree di relax.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Contribuisce alla conservazione e valorizzazione del patrimonio storico e culturale. Migliora l'appeal turistico delle aree storiche, attirando visitatori e promuovendo l'economia locale. Fornisce spazi pubblici funzionali e piacevoli per i residenti e i visitatori, migliorando la qualità della vita.
Svantaggi: L'uso di materiali e tecniche in linea con l'architettura storica può essere più costoso rispetto alle soluzioni moderne. Progetti in aree storiche spesso richiedono approvazioni e permessi specifici, che possono rallentare il processo. Gli arredi storici possono richiedere una manutenzione più frequente e specialistica per preservare il loro aspetto originale.
Rischi: Se non progettati correttamente, gli elementi di arredo urbano possono risultare inappropriati o in conflitto con l'estetica storica. L'installazione di nuovi elementi potrebbe danneggiare strutture storiche esistenti se non effettuata con attenzione. La comunità locale potrebbe resistere a modifiche che alterano l'aspetto tradizionale del quartiere.

SINERGIE E INTERAZIONI

Coinvolgere esperti di storia e architettura per assicurare che i progetti rispettino e valorizzino il contesto storico. Integrazione discreta di tecnologie moderne (illuminazione LED, sistemi di sorveglianza, Wi-Fi) per migliorare la funzionalità senza compromettere l'estetica storica. Coinvolgere i residenti e le comunità locali nei processi di pianificazione per garantire che le soluzioni proposte siano ben accolte e rispettino le tradizioni locali.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali

DISPOSITIVI PER LA FRUIZIONE DEGLI SPAZI PUBBLICI

miglioramento dell'aspetto formale dei piccoli centri

COMPATIBILITÀ : A
REVERSIBILITÀ : A
INVASIVITÀ : B
AZIONI migliora

COLORI COMPATIBILI

LEGNO
CORTEN
GRIGIO CANNA DI FUCILE
PIETRA LOCALE

SPECIFICHE TECNICHE

APPLICAZIONE NEI CENTRI URBANI PER MIGLIORARE L'ASPETTO DEI LUOGHI E GARANTIRE LA RICONOSCIBILITA' DELL'ARCHITETTURA

In. 07 BOCCHETTE D'ARIA IN PIETRA LOCALE

PRINCIPIO DI FUNZIONAMENTO

Le bocchette d'aria in pietra locale sono progettate per permettere la ventilazione e l'uscita dell'aria, allo stesso tempo nascondono o occultano impianti tecnologici e tubature esterne in facciate degli edifici. Sono realizzate in pietra locale e si integrano armoniosamente con l'architettura dell'edificio, mantenendo l'estetica desiderata. La pietra è lavorata per formare aperture funzionali che permettono il passaggio dell'aria senza compromettere la protezione estetica. Sono progettate con fessure e aperture strategiche per consentire il flusso d'aria e facilitare la ventilazione, senza ostacoli. Il design della bocchetta è studiato per coprire e nascondere impianti tecnologici e tubazioni, come quelle di ventilazione e condizionamento, rendendoli meno visibili e migliorando l'aspetto esteriore dell'edificio.

APPLICABILITÀ

Le bocchette d'aria in pietra locale possono essere utilizzate: Per integrare funzionalità di ventilazione nelle facciate delle abitazioni senza compromettere l'aspetto estetico, Negli edifici commerciali, per migliorare l'estetica esterna mentre si gestiscono le esigenze di ventilazione e impiantistica, Per ristrutturare o restaurare edifici storici, mantenendo la coerenza architettonica e nascondendo impianti tecnologici senza alterare il design originale, In scuole, ospedali e altri edifici pubblici, per integrare elementi di ventilazione senza compromettere il design architettonico e la funzionalità degli spazi.

VANTAGGI / SVANTAGGI / RISCHI

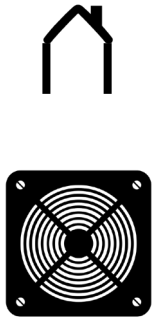
Vantaggi: Permettono di nascondere impianti e tubature mentre si integra armoniosamente con l'architettura dell'edificio, mantenendo l'estetica desiderata. Offrono una ventilazione efficace senza compromettere la bellezza della facciata.La pietra locale è un materiale resistente e durevole che può sopportare le condizioni ambientali senza degradarsi facilmente.
Svantaggi: La realizzazione di bocchette d'aria in pietra locale può essere costosa, sia per i materiali che per la lavorazione artigianale. Richiedono una progettazione e un'installazione precise per garantire che la ventilazione e l'occultamento siano efficaci.
Rischi: Potrebbero non essere compatibili con tutte le tipologie di facciate o strutture esistenti senza modifiche strutturali. La pietra può richiedere manutenzione regolare per mantenere l'aspetto e le prestazioni nel tempo, specialmente in ambienti particolarmente umidi o inquinati. Le bocchette devono essere progettate per garantire che non si verifichino ostruzioni o accumuli di detriti che possano compromettere la ventilazione.

SINERGIE E INTERAZIONI

Le bocchette d'aria in pietra locale possono essere utilizzate in sinergia con altre tecnologie e materiali per ottimizzare le prestazioni complessive: Possono essere integrate con sistemi di ventilazione meccanica per garantire un flusso d'aria ottimale e una buona qualità dell'aria interna. Possono essere abbinate a materiali da costruzione complementari per migliorare le prestazioni energetiche e estetiche complessive dell'edificio.

NORMATIVA DI RIFERIMENTO

Legge 1150 del 1942 e Regolamenti edilizi comunali



DISPOSITIVI PER NASCONDERE ELEMENTI TECNOLOGICI DI DISTURBO ALL'ARCHITETTURA

implementazione tecnologica

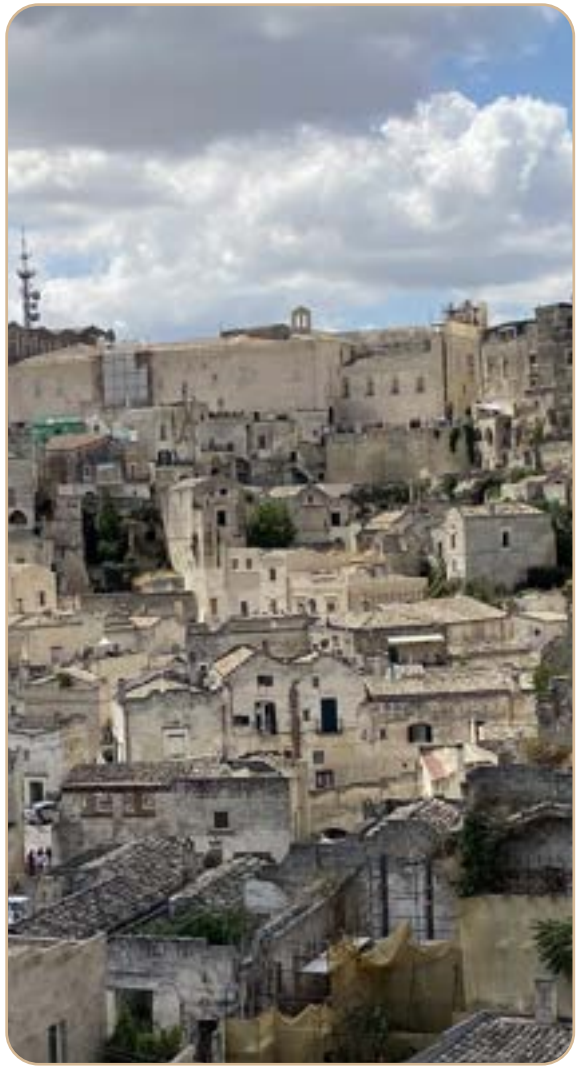
COMPATIBILITÀ : A
REVERSIBILITÀ : M
INVASIVITÀ : B - M
AZIONI nasconde

COLORI COMPATIBILI

PIETRA LOCALE

SPECIFICHE TECNICHE

SI APPLICA PER OCCULTARE E CELARE ELEMENTI TECNOLOGICI CON UN LINGUAGGIO NON IDONEO ALLE PECULIARITA' FORMALI DELL'ARCHITETTURA



I ART MADONIE

"IL POLO DIFFUSO PER LA RIQUALIFICAZIONE URBANA DELLE PERIFERIE DEI COMUNI DELLE MADONIE", ideato e diretto da I WORLD, capofilato da SO.SVI.MA. S.P.A. e finanziato dal Bando della Presidenza del Consiglio dei Ministri pubblicato sulla Gazzetta Ufficiale del 1 giugno 2016, Programma straordinario di intervento per la riqualificazione urbana e la sicurezza delle periferie delle città metropolitane e dei comuni capoluogo di provincia – D.P.C.M. 25/05/2016 (G.U. 127 del 01/06/2016) – CUP E22F17000320001

Arte e cultura per la rigenerazione urbana dei borghi del Parco delle Madonie

Riqualificazione di 9 immobili, creazione di 18 centri culturali polivalenti, laboratori, creazione di opere d'arte contemporanea a cura di artisti nazionali e internazionali, processi innovativi di gestione di siti culturali e partecipazione attiva delle comunità locali

Linee Guida

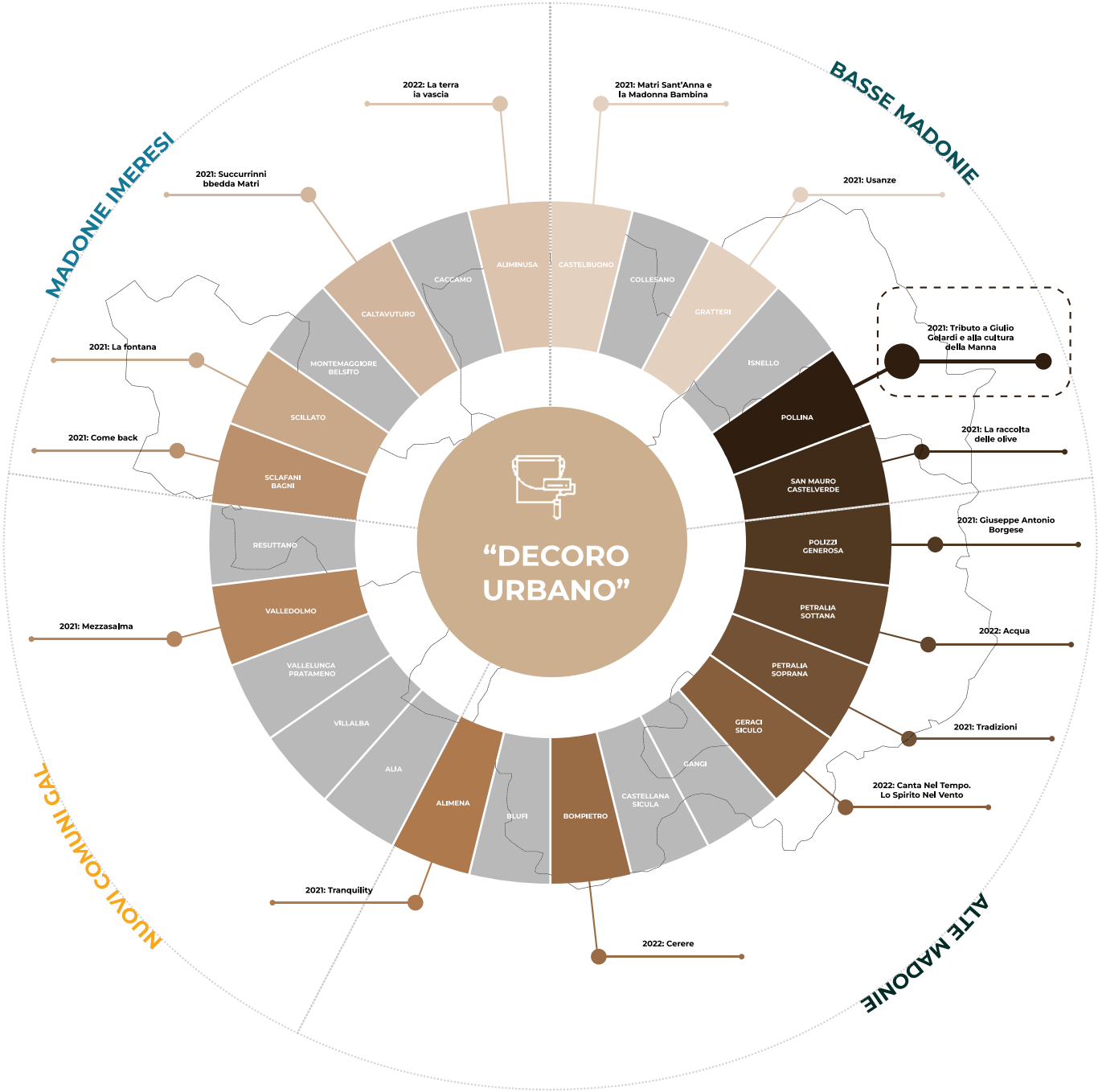
- **analisi del contesto:** valutazione delle risorse: effettuare un'analisi delle risorse culturali, storiche e artistiche di ciascun comune madonita per identificare le peculiarità e le opportunità di sviluppo.
- **coinvolgimento delle parti interessate:** consultare le autorità locali, le associazioni culturali, gli artisti locali e la comunità per comprendere le aspettative e coinvolgere attivamente tutte le parti interessate.
- **definizione degli obiettivi del progetto:** visione comune: coinvolgere i rappresentanti dei comuni madoniti nella definizione di una visione comune per il progetto "i art madonie", condividendo gli obiettivi e gli impatti desiderati per l'intera regione.
- **creazione di gruppi di lavoro:** partecipazione attiva: creare gruppi di lavoro multidisciplinari, inclusivi di rappresentanti di ciascun comune, per garantire la partecipazione attiva di tutte le aree coinvolte nel progetto.
- **ruoli chiari:** definire chiaramente i ruoli e le responsabilità di ciascun comune nei diversi aspetti del progetto, promuovendo la collaborazione e la complementarità delle risorse.
- **promozione della cultura locale:** valorizzazione dell'identità culturale: sottolineare l'importanza di valorizzare l'identità culturale di ciascun comune madonita, incorporando tradizioni locali e elementi distintivi nelle opere d'arte e nelle iniziative culturali.
- **attività partecipative:** laboratori creativi: organizzare laboratori creativi e incontri partecipativi che coinvolgano la comunità nel processo creativo, incoraggiando la collaborazione e l'inclusione di idee provenienti da diverse realtà.
- **infrastruttura e accessibilità:** sviluppo di spazi culturali: promuovere lo sviluppo di spazi culturali accessibili e attrattivi in ogni comune, favorendo la creazione di luoghi dedicati all'esposizione di opere d'arte e alla fruizione culturale. Accessibilità digitale: implementare strumenti digitali per garantire un'ampia accessibilità alle iniziative culturali, coinvolgendo sia la popolazione locale che un pubblico più ampio.
- **programmazione eventi condivisa:** calendario unificato: coordinare e condividere un calendario di eventi culturali che coinvolga tutti i comuni madoniti, evitando sovrapposizioni e massimizzando la partecipazione.
- **risorse finanziarie e sostenibilità:** ricerca di fondi comuni: esplorare opzioni di finanziamento condivise tra i comuni, promuovendo la sostenibilità economica del progetto "i art madonie". coinvolgimento del settore privato: coinvolgere il settore privato attraverso partenariati e sponsorizzazioni per sostenere finanziariamente le attività culturali.
- **monitoraggio e valutazione:** indicatori di successo: definire indicatori chiave di successo e stabilire meccanismi di monitoraggio e valutazione per misurare l'impatto del progetto sui singoli comuni e sull'intera regione.
- **comunicazione efficace:** piano di comunicazione: elaborare un piano di comunicazione efficace per informare la comunità, i visitatori e i potenziali sostenitori sulle attività culturali e artistiche, creando un'immagine positiva della regione.

Benefici del principio di inclusività

Meno del 60% dei comuni del distretto madonita partecipa attivamente al progetto. L'adozione delle linee guida proposte rappresenta una tappa cruciale per ampliare il coinvolgimento e assicurare che l'intero territorio possa beneficiare di un processo di valorizzazione che non sia solo capillare ma anche coerente e inclusivo. L'obiettivo punta a promuovere una vera e propria trasformazione territoriale, dove ogni comune possa giocare un ruolo chiave nello sviluppo complessivo del distretto. Le linee guida proposte mirano non solo alla fruizione ottimale delle risorse locali, ma anche a delineare un'identità visiva forte e riconoscibile per i borghi madoniti, valorizzando il paesaggio, l'architettura, e le tradizioni culturali in una prospettiva contemporanea. Questa identità comune rafforzerà il senso di appartenenza tra i residenti e faciliterà la promozione del distretto come destinazione unica, sia per i visitatori che per gli investitori. Il rafforzamento dell'immagine coordinata e della percorribilità dei borghi, inteso anche come miglioramento delle infrastrutture e dell'accessibilità, renderà il territorio più attraente non solo dal punto di vista turistico,

ma anche come luogo di sviluppo culturale e sociale. L'implementazione delle linee guida va oltre il semplice restauro o recupero del patrimonio architettonico: essa mira a creare un contesto in cui la valorizzazione del territorio madonita sia globale e sostenibile. Ciò significa integrare la storia e le radici culturali di ciascun comune in una visione dinamica, capace di rispondere alle sfide contemporanee attraverso soluzioni innovative. L'equilibrio tra tradizione e innovazione è fondamentale: mentre si preservano le eredità culturali, l'introduzione di tecnologie moderne e pratiche sostenibili aiuterà a rendere il distretto non solo più attrattivo, ma anche resiliente di fronte alle future esigenze economiche e ambientali. Un altro aspetto chiave è la concezione del distretto non come una somma di entità separate, ma come un network collaborativo, dove ogni comune è parte di un mosaico più grande. Questa visione sinergica facilita una gestione condivisa delle risorse, ottimizzando gli investimenti e riducendo le disparità tra le varie realtà locali.

COMUNI CONVOLTI	
ALTE MADONIE	6/9
BASSE MADONIE	4/6
MADONIE IMERESI	4/6
	14/21
COLLABORAZIONE	15/26
% COMUNI COINVOLTI	**57,7%**



Nonostante questi punti critici, il decoro urbano è un elemento fondamentale per la qualità della vita nelle città. Con un impegno costante da parte delle amministrazioni pubbliche, dei cittadini e delle imprese, è possibile realizzare un decoro urbano curato e sostenibile, che contribuisca a migliorare la vivibilità delle città e a renderle più attrattive per residenti e turisti.

FATTORI TRAINANTI

Miglioramento della qualità della vita: Un ambiente urbano curato e decoroso contribuisce a migliorare la qualità della vita dei cittadini, rendendo le città più piacevoli da vivere e da visitare.

Incremento del senso di appartenenza: Un decoro urbano curato può rafforzare il senso di appartenenza dei cittadini alla propria città, creando un legame più forte con il territorio.

Promozione del turismo: Un ambiente urbano bello e accogliente può attrarre turisti, favorendo lo sviluppo economico della città.

Riduzione della criminalità: Un ambiente urbano curato e decoroso può contribuire a ridurre la criminalità, creando un senso di sicurezza e di controllo del territorio.

Aumento del valore immobiliare: Un decoro urbano curato può aumentare il valore degli immobili, rendendo la città più attrattiva per investitori e residenti.

PUNTI CRITICI

Costi elevati: Il mantenimento di un decoro urbano curato può essere costoso, richiedendo investimenti in interventi di manutenzione, pulizia e riqualificazione urbana.

Mancanza di risorse: Non tutte le città hanno le risorse sufficienti per dedicarsi al decoro urbano in modo adeguato.

Difficoltà di gestione: La gestione del decoro urbano può essere complessa, richiedendo la collaborazione di diverse figure professionali e la coordinazione di diversi interventi.

Mancanza di senso civico: La mancanza di senso civico da parte di alcuni cittadini può rappresentare un ostacolo al mantenimento del decoro urbano, con comportamenti come atti di vandalismo o abbandono di rifiuti.

Difficoltà di coinvolgimento dei cittadini: Il coinvolgimento dei cittadini nella gestione del decoro urbano può essere difficile, soprattutto in contesti con una bassa partecipazione civica.

VALUTAZIONE DEI CRITERI SMART PER L'ADEGUAMENTO ACUSTICO E PROPOSTE DI INTERVENTO

Pollina; ©Quelli del Parco delle Madonie, 2023

13.1 - LA DIAGNOSI DELL'ACUSTICA

Il quadro normativo per l'isolamento acustico è definito dal Decreto del Presidente del Consiglio dei Ministri (DPCM) 5/12/97, conforme alla legge quadro 447/95. Questo decreto stabilisce i requisiti acustici passivi degli edifici con l'obiettivo di ridurre l'esposizione al rumore e fa riferimento alla qualità dell'edificio nel suo complesso, non solo alle singole parti.

Per valutare le prestazioni dell'isolamento acustico, vengono utilizzati specifici indici che determinano la classificazione degli edifici e i limiti previsti per ciascuna categoria. Questi indici includono:

- R'w: Indice di potere fonoisolante apparente tra le partizioni, che misura le prestazioni dell'isolamento acustico di pareti e solai, espresso in decibel (dB).
- D2m,nt,w: Isolamento acustico normalizzato delle facciate, espresso in dB, per i rumori aerei provenienti dall'esterno.
- L'n,w: Indice normalizzato del livello di rumore da calpestio tra gli ambienti di un pavimento finito.
- LASmax: Livello massimo prodotto dagli impianti tecnologici a servizio discontinuo, come bagni, scarichi idraulici, ascensori, ecc.
- LAeq: Livello equivalente di rumore prodotto dagli impianti tecnologici ad uso continuo, come condizionatori, riscaldamento, ecc.

Questi parametri consentono di interpretare i valori di isolamento acustico che devono essere rispettati alla fine di un cantiere. Si stabilisce che l'abbattimento acustico richiesto è di 50 dB per tutti gli edifici, ad eccezione degli ospedali e strutture simili, per i quali il valore di riferimento è di 55 dB.

Inoltre, a livello europeo, l'isolamento acustico delle costruzioni residenziali è regolamentato dalla norma UNI 11367 del 2010. Questa norma classifica gli immobili ad uso abitativo in quattro categorie di valutazione dell'isolamento acustico, con la classe 1 che rappresenta il livello più alto di isolamento, garantendo un ambiente più silenzioso, mentre la classe 4 indica un ambiente più rumoroso.

La classificazione non solo fornisce informazioni ai futuri proprietari sull'isolamento acustico dell'abitazione, ma protegge anche tutte le parti coinvolte nel processo edilizio da possibili contestazioni future. Inoltre, questa norma ha un impatto significativo sul valore commerciale degli immobili durante le trattative di compravendita, tanto che la determinazione della classe di efficienza acustica è diventata una pratica sempre più richiesta.

È essenziale comprendere la differenza tra fonoassorbimento e fonoisolamento. Il fonoassorbimento mira a controllare la riflessione del suono sulle superfici di un ambiente, contribuendo a definire il livello di riverbero all'interno di esso. D'altro canto, il fonoisolamento si concentra sulla limitazione della trasmissione del rumore tra due ambienti separati, impedendo la propagazione del suono. Il parametro dell'isolamento acustico misura la capacità di un edificio di ridurre la trasmissione sonora tra ambienti diversi, mentre il parametro dell'assorbimento acustico riguarda la capacità di un materiale specifico di evitare la riflessione del suono nell'ambiente o verso la sua sorgente.

In base a queste definizioni, è cruciale, durante la fase di progettazione dei sistemi edilizi, considerare attentamente il fonoisolamento al fine di prevenire la trasmissione del rumore.

L'isolamento acustico comprende, quindi, tutte le misure e gli interventi volti a ostacolare la propagazione dei suoni e dei rumori, con l'obiettivo di ridurre o addirittura eliminare il disagio acustico negli edifici all'interno delle aree urbane.

Il rumore rappresenta una sfida complessa da affrontare poiché, durante la costruzione o l'uso di un sistema, non è visibile direttamente, ma si manifesta nel corso delle attività quotidiane. Tuttavia, è possibile riconoscerlo e prevenirlo attraverso un'attenta analisi previsionale, specialmente durante la fase di progettazione di un sistema edilizio. Pertanto, l'isolamento acustico dovrebbe essere una priorità sin dall'inizio dei processi di progettazione.

All'interno del settore edilizio, possiamo distinguere due principali categorie di rumori: quelli aerei e quelli strutturali o impattivi. I rumori aerei si propagano esclusivamente attraverso la vibrazione dell'aria, trasmettendosi attraverso il mezzo aereo.

D'altra parte, i rumori strutturali si diffondono come vibrazioni attraverso gli elementi del sistema edilizio, come le partizioni orizzontali o i solai.

Un esempio di rumore aereo potrebbe essere il suono proveniente da una televisione, mentre un esempio di rumore strutturale potrebbe essere il rumore dei passi al piano superiore. È importante notare che queste due categorie di rumori sono interconnesse, poiché un rumore aereo può successivamente trasformarsi in un rumore strutturale.

Per valutare la trasmissione del suono attraverso i componenti edilizi, come pareti o solai, vengono utilizzate leggi di massa in fase di previsione.

Queste leggi comprendono una serie di espressioni matematiche che mettono in relazione la massa del componente edilizio con la sua capacità di isolamento acustico. Tuttavia, per ottenere risultati affidabili, è necessario sempre considerare i principi fisici fondamentali dell'acustica, in particolare la risonanza e la coincidenza.

La risonanza di una struttura si verifica quando la frequenza dell'onda sonora che colpisce la struttura coincide con la frequenza naturale di vibrazione della stessa. Ciò provoca una vibrazione sincrona e una notevole riduzione della capacità di isolamento acustico. La coincidenza, invece, si verifica quando l'onda sonora incidente non è perpendicolare e, a una frequenza specifica (nota come frequenza critica), l'elemento edilizio è suscettibile di vibrazioni che trasmettono gran parte dell'energia sonora attraverso di esso.

Entrambi questi fenomeni mettono in discussione la capacità di isolamento acustico, indicata con il parametro R, dell'elemento edilizio. Il valore di R rappresenta il livello di rumore che passa attraverso l'elemento edilizio da un ambiente all'altro, nel caso di un tramezzo interno.

La valutazione dell'isolamento acustico coinvolge tutti questi concetti menzionati e si basa sulle fondamenta fisiche dell'acustica per stimare in modo accurato gli interventi necessari per una progettazione adeguata del sistema edilizio.

L'inclusione del progetto di isolamento acustico deve essere una priorità nelle prime fasi della progettazione del sistema edilizio, che vanno dalla progettazione architettonica alla progettazione impiantistica, influenzando ogni decisione progettuale. Un approccio interdisciplinare è fondamentale poiché le scelte di un professionista possono influenzare le soluzioni progettuali di un altro. Un esempio semplice riguarda la progettazione degli impianti, noti per il loro potenziale impatto acustico all'interno delle abitazioni. La posizione di un componente impiantistico in una partizione con bassa capacità di isolamento acustico può peggiorare ulteriormente la situazione, causando disagio nell'ambiente abitativo. La corretta progettazione dell'isolamento acustico dipende principalmente dai materiali utilizzati e dalla loro installazione. Non è solo una questione delle caratteristiche tecniche intrinseche, come i metodi costruttivi o la scelta dei materiali, ma anche delle connessioni tra questi elementi e l'intera struttura edilizia. Queste connessioni rappresentano la fonte principale dei cosiddetti ponti acustici, che sono percorsi preferenziali per il passaggio del rumore all'interno dell'edificio.

L'acustica applicata all'edilizia richiede una valutazione interdisciplinare delle soluzioni e un'attenzione particolare ai dettagli, poiché sono proprio questi dettagli a fare la differenza nella progettazione impeccabile. Per ottenere un adeguato isolamento acustico, è essenziale considerare ogni aspetto del progetto, rilevare la presenza di possibili ponti acustici e intervenire per eliminarli. Pertanto, è fondamentale che tutte le valutazioni progettuali siano coordinate tra i vari professionisti coinvolti e che sia presente un professionista specializzato nella redazione di un progetto acustico, che rispetti i requisiti normativi e soddisfi le esigenze di comfort acustico in ciascuna unità abitativa.

Partizioni verticali: l'isolamento acustico delle partizioni divisorie tra due alloggi

Per valutare il primo requisito di isolamento acustico passivo, che riguarda la separazione tra diverse unità abitative e fa riferimento all'indice del potere fonoisolante apparente delle partizioni tra ambienti, è fondamentale esaminare attentamente il meccanismo di trasmissione del suono attraverso di esse. Questa trasmissione può avvenire direttamente attraverso la partizione stessa, nota come trasmissione diretta, o attraverso percorsi laterali, come giunti o partizioni adiacenti, che costituiscono trasmissioni laterali. La costruzione delle pareti divisorie tra unità immobiliari richiede la massima precisione nell'installazione. È essenziale realizzare queste partizioni al di sopra della soletta strutturale prima della realizzazione degli strati successivi del solaio. Questa precauzione consente di migliorare le prestazioni di isolamento acustico, soprattutto alle basse frequenze, e di limitare le trasmissioni sonore laterali. Per evitare ulteriori ponti acustici, è cruciale progettare attentamente gli elementi di connessione tra le strutture e prevenire errori durante l'installazione. Ad esempio, nella progettazione di una parete divisoria tra unità abitative, è necessario considerare la posizione di tracce impiantistiche o scatole elettriche. È importante evitare la disposizione di scatole elettriche contrapposte e prevedere l'isolamento adeguato di eventuali cassette elettriche mediante l'uso di materiali sigillanti per eliminare potenziali ponti acustici.

Partizioni orizzontali: l'isolamento acustico al calpestio dei solai

Per soddisfare il requisito di isolamento acustico dai rumori di calpestio, al fine di limitare la propagazione del rumore, è fondamentale fare una scelta accurata del materiale isolante per il calpestio e prestare la massima attenzione ai dettagli durante la sua installazione. La strategia più comunemente adottata consiste nel creare un elemento separato da tutte le strutture rigide circostanti per impedire la trasmissione delle vibrazioni sonore. Questo ruolo è stato svolto negli ultimi anni dai materassini anticalpestio. La prima caratteristica da valutare è la resistenza del materiale, ossia la sua capacità di rimanere integro nel tempo. Durante l'installazione, è importante avere una chiara pianificazione del cantiere poiché l'isolante per il calpestio viene posato subito dopo l'installazione degli impianti e prima della fase di finitura delle pareti divisorie. Pertanto, è essenziale proteggere questo strato in modo da non comprometterne le prestazioni tecniche.

Un parametro fisico fondamentale da valutare è la rigidità dinamica, che rappresenta la capacità resiliente del materiale e può essere certificata in laboratorio. Tra le opzioni disponibili sul mercato per i sistemi anticalpestio, si possono citare materiali come gomme e derivati, fibre minerali (sintetiche o naturali), polietilene, multistrato, e schiume poliuretaniche o siliconiche. Negli ultimi anni, i materiali isolanti più diffusi includono gomme e fibre minerali.

Dopo aver selezionato un prodotto anticalpestio di qualità, è fondamentale procedere con l'installazione corretta. Gli errori da evitare riguardano spesso la posa in corrispondenza dei punti di giunzione, come ad esempio durante l'installazione di sanitari a pavimento, la nicchia del collettore del riscaldamento a pavimento o il piatto doccia. In ciascuno di questi casi, è necessario prevedere l'installazione completa del sistema anticalpestio. Ad esempio, per la nicchia, è importante estendere la posa dell'isolante e della fascetta laterale all'interno del volume contenente il collettore. Nel caso del piatto doccia, si dovrebbe evitare di utilizzare un sistema anticalpestio e preferire un letto di sabbia.

In conclusione, è importante sottolineare che il corretto isolamento acustico dipende in gran parte dalla qualità della posa del materiale isolante.

Facciate: l'isolamento acustico dai rumori proveniente dall'esterno

L'isolamento acustico della facciata si riferisce alle strutture divisorie tra gli spazi interni ed esterni, strettamente connesso al rumore del traffico veicolare. Tra gli elementi maggiormente sensibili dal punto di vista acustico, ci sono sicuramente le finestre e gli accessori come i cassonetti o le chiusure oscuranti, che richiedono una progettazione mirata per garantire un'adeguata capacità fonoisolante.

Altri aspetti rilevanti includono l'isolamento termico a cappotto, le prese d'aria e i sistemi di ventilazione meccanica controllata, i quali devono essere progettati con cura per collegare correttamente le parti meno resistenti a quelle con prestazioni fonoisolanti superiori. Un buon isolamento dai rumori esterni dipende principalmente dalle prestazioni acustiche dei serramenti, i quali devono essere dotati di elevate capacità fonoisolanti. Questo processo richiede la valutazione non solo della parte trasparente del serramento, ma anche delle pareti adiacenti e dei giunti. Le prestazioni acustiche del serramento dipendono in gran parte dall'efficienza della tenuta all'aria del telaio, regolata dalle norme UNI EN 12207 e UNI EN 12152.

L'installazione del serramento è un passaggio cruciale e deve essere eseguita con precisione per evitare ponti termici e acustici. Negli ultimi anni, la norma UNI 11296 ha definito la figura del posatore specializzato, incaricato di garantire una posa a regola d'arte, prestando attenzione ai dettagli come il controtelaio, il collegamento alla muratura e la sigillatura, per assicurare una tenuta perfetta. L'impresa esecutrice deve inoltre assicurarsi che vengano eliminati gli elementi di discontinuità che potrebbero favorire la formazione di ponti acustici, seguendo gli schemi previsti dalla norma.

Infine, un aspetto critico è l'isolamento dai rumori generati dagli impianti, sia continui (come riscaldamento e ventilazione meccanica) che discontinui (come servizi igienici e rubinetteria). Questi rumori si diffondono attraverso le vibrazioni delle strutture rigide, propagandosi all'interno degli edifici. La scelta delle tecnologie impiantistiche deve rispettare i limiti di rumore stabiliti dal D.P.C.M. 5/12/97, e la corretta installazione degli impianti richiede l'uso di materiali elastici per isolare i componenti e prevenire la formazione di ponti acustici, riducendo così l'impatto del rumore sugli occupanti degli edifici.

INDICE DELLE SOLUZIONI INDIVIDUATE

In. 01 - Materiali fonoassorbenti
In. 02 - Pannelli fonoassorbenti
In. 03 - Tende fonoassorbenti
In. 04 - Pavimenti e controsoffitti fonoassorbenti
In. 05 - Schiume nano-strutturate
In. 06 - Intonaci isolanti
In. 07 - Infissi a tenuta stagna e isolanti

LEGENDA ICONE

Ambito residenziale

Pannello isolante

Tendaggi

Schiume

Intonaci

Infissi

Alimena - Chiesa del Bulgarito; ©Quelli del Parco delle Madonie, 2023

In. 01 MATERIALI FONOASSORBENTI

PRINCIPIO DI FUNZIONAMENTO

I materiali fonoassorbenti sono essenziali per ridurre il livello di rumore attraverso l'assorbimento dell'energia sonora. Tale fenomeno è regolato da diverse modalità:
Assorbimento per attrito: l'energia sonora si trasforma in calore all'interno del materiale tramite attrito.
Assorbimento per risonanza: il materiale vibra in sintonia con il suono, dissipando l'energia sonora.
Assorbimento per porosità: la struttura porosa intrappola le onde sonore, riducendo così il loro impatto.

APPLICABILITÀ

I materiali fonoassorbenti trovano utilizzo in vari contesti, tra cui:
Edifici: per migliorare l'isolamento acustico e il comfort abitativo.
Industria: per ridurre il rumore negli ambienti lavorativi.
Trasporti: per l'insonorizzazione di veicoli come auto e aerei.
Sale da concerto e teatri: per ottimizzare l'acustica e migliorare l'esperienza sonora.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Riduzione del rumore: aumentano il comfort acustico e la qualità della vita.
Migliore intelligibilità del parlato: agevolano la comunicazione in ambienti rumorosi.
Aumento della produttività: riducono lo stress e la fatica derivanti dal rumore.
Maggiore privacy: limitano la trasmissione del suono tra ambienti adiacenti.
Svantaggi: Costi elevati: soprattutto per i materiali più performanti.
Spessore: alcune soluzioni possono risultare ingombranti, limitandone l'applicabilità.
Manutenzione: taluni materiali richiedono interventi periodici per garantirne l'efficacia nel tempo.
Rischi: Infiammabilità: alcune tipologie possono essere soggette a incendio.
Emissione di sostanze nocive: alcuni materiali possono rilasciare composti dannosi nell'ambiente.

SINERGIE E INTERAZIONI

Frequenza del suono: l'efficacia dei materiali dipende dalla frequenza delle onde sonore.
Interazione con altri materiali: la combinazione con altri materiali da costruzione può influenzare l'efficacia dei fonoassorbenti.

NORMATIVA DI RIFERIMENTO

Legge n. 157 del 9 luglio 1992, Decreto del Ministero dell'Ambiente del 18 dicembre 1992, Circolare del Ministero dell'Ambiente del 30 marzo 1993, UNI 11300-1:2014, UNI 11300-2:2014, UNI 11300-3:2014, UNI 11300-4:2014, Direttiva 2009/147/CE, Regolamento (UE) n. 1143/2014

MATERIALI PER L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola

COLORI COMPATIBILI

TUTTI

SPECIFICHE TECNICHE

NEI CASI DI ARCHITETTURA CON PIETRA A FACCIA VISTA, E' OPPORTUNO APPLICARLO NELLA PORZIONE INTERNA DEL MURO.

In. 02 PANNELLI FONOASSORBENTI

PRINCIPIO DI FUNZIONAMENTO

I pannelli fonoisolanti bloccano il passaggio del suono attraverso la loro massa e resistenza. Il suono viene trasmesso come vibrazione attraverso il pannello, ma parte di questa energia viene dissipata sotto forma di calore.

APPLICABILITÀ

I pannelli fonoisolanti possono essere utilizzati in diverse situazioni:
Barriere stradali: per proteggere le abitazioni dal rumore del traffico.
Barriere ferroviarie: per proteggere le abitazioni dal rumore dei treni.
Pareti divisorie interne: per migliorare l'isolamento acustico tra ambienti adiacenti.
Cappottature di macchinari: per ridurre il rumore prodotto da macchinari industriali.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:
Elevata efficacia di isolamento acustico: possono ridurre il livello di rumore di 10-20 dB.
Facilità di installazione: possono essere installati su qualsiasi tipo di struttura.
Versatilità: sono disponibili in diverse dimensioni, spessori e materiali.
Durata: sono resistenti agli agenti atmosferici e alle intemperie.
Svantaggi:
Costo: possono essere costosi, soprattutto i pannelli più performanti.
Impatto estetico: possono non essere adatti a tutti i contesti architettonici.
Peso: possono essere pesanti e richiedere una struttura di supporto adeguata.
Rischi:
Infiammabilità: alcuni pannelli fonoisolanti possono essere infiammabili.
Rilascio di sostanze nocive: alcuni pannelli fonoisolanti possono rilasciare sostanze nocive nell'aria.

SINERGIE E INTERAZIONI

Efficacia: l'efficacia dei pannelli fonoisolanti dipende dalla frequenza del suono.
Altri materiali: l'interazione con altri materiali da costruzione può influenzare l'efficacia dei pannelli fonoisolanti.

NORMATIVA DI RIFERIMENTO

Decreto Presidenziale 5 dicembre 1997, n. 507 - UNI EN ISO 11654:2009 - UNI EN ISO 354 - Direttiva 2002/44/CE - Regolamento (UE) n. 305/2011 - Norma EN 13501-1

PANNELLI PER L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola

COLORI COMPATIBILI

QUALSIASI

SPECIFICHE TECNICHE

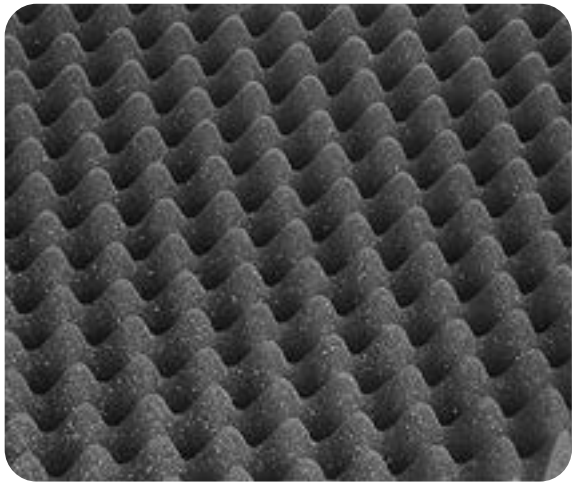
E' PREFERIBILE ALL'INTERNO DEGLI EDIFICI O ALL'ESTERNO SE LA MURATURA NON E' A FACCIA VISTA

Esempi di pannelli fonoassorbenti

Pannello di lana di vetro o lana di roccia

Pannello fonoassorbente in legno

Pannello fonoassorbente in poliestere



Pannello fonoassorbente in schiuma acustica

Ecco alcune informazioni relative ai possibili pannelli fonoassorbenti da applicare.

Pannelli di lana di vetro o lana di roccia: Questi materiali sono ampiamente utilizzati per l'isolamento acustico negli edifici grazie alla loro efficacia nel ridurre il rumore e alla relativa economicità. Possono essere installati a soffitto o parete.

Pannelli fonoassorbenti in legno: Questi pannelli offrono un'estetica naturale e possono essere utilizzati per migliorare l'acustica degli ambienti senza compromettere lo stile dell'edificio. Sono disponibili in varie finiture e forme.

Pannelli fonoassorbenti in poliestere: Questi pannelli sono leggeri, flessibili e disponibili in diverse densità e colori. Possono essere facilmente installati a soffitto o parete e offrono un'ottima performance acustica.

Pannelli fonoassorbenti in schiuma acustica: Realizzati in schiuma poliuretanica o poliuretano, questi pannelli sono adatti per ridurre il rumore in ambienti come studi di registrazione, sale prove o sale conferenze.

In. 03 TENDE FONOASSORBENTI

PRINCIPIO DI FUNZIONAMENTO

Le tende fonoassorbenti sono realizzate con materiali speciali che assorbono e riducono il rumore, migliorando l'acustica degli ambienti interni. Queste tende funzionano attraverso vari strati di tessuti densi e strutture che catturano le onde sonore, trasformando l'energia sonora in calore grazie alla loro struttura porosa e alla densità del materiale. Il processo di fonoassorbimento avviene in questo modo:
Assorbimento iniziale: Le onde sonore colpiscono la superficie della tenda fonoassorbente.
Conversione dell'energia: La struttura porosa e densa della tenda assorbe le onde sonore, convertendo l'energia sonora in calore attraverso vibrazioni interne.
Riduzione del riverbero: La riduzione del riverbero e dell'eco migliora la qualità acustica dell'ambiente, rendendolo più confortevole.

APPLICABILITÀ

Le tende fonoassorbenti sono adatte per diversi contesti e ambienti, tra cui:
Uffici: Per migliorare l'acustica e ridurre il rumore di fondo, favorendo la concentrazione e la produttività.
Sale conferenze: Per garantire una migliore qualità del suono durante riunioni e presentazioni. **Studi di registrazione:** Per ottenere un'acustica ottimale durante le sessioni di registrazione e produzione musicale.
Case: Per creare ambienti domestici più silenziosi e confortevoli, riducendo i rumori esterni e interni.
Ristoranti e locali pubblici: Per migliorare l'ambiente acustico, riducendo il rumore di fondo e migliorando l'esperienza dei clienti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Significativa riduzione del rumore ambientale, migliorando la qualità del suono e il comfort acustico. Disponibili in vari colori e design, possono integrarsi facilmente con l'arredamento esistente. Possono essere montate facilmente su finestre e pareti, senza necessità di interventi strutturali. Possono contribuire anche all'isolamento termico, migliorando l'efficienza energetica degli edifici.
Svantaggi/Rischi:
Potrebbero avere un costo iniziale elevato rispetto alle tende tradizionali. Richiedono una manutenzione regolare per mantenere la loro efficacia acustica e l'estetica. In ambienti estremamente rumorosi, potrebbero non essere sufficienti da sole e necessitare di ulteriori soluzioni acustiche.

SINERGIE E INTERAZIONI

Le tende fonoassorbenti possono essere utilizzate in sinergia con altre soluzioni per migliorare l'acustica e l'efficienza energetica degli edifici. L'uso combinato con pannelli fonoassorbenti su pareti e soffitti può massimizzare l'assorbimento acustico. Utilizzare tappeti e moquette fonoassorbenti per ridurre ulteriormente i rumori di fondo e migliorare l'acustica. L'installazione di doppi vetri alle finestre, insieme alle tende fonoassorbenti, può migliorare l'isolamento acustico e termico. L'uso di mobili imbottiti e librerie può aiutare a disperdere e assorbire le onde sonore, completando l'efficacia delle tende fonoassorbenti.

NORMATIVA DI RIFERIMENTO

Decreto Presidenziale 5 dicembre 1997, n. 507 - UNI EN ISO 11654:2009 - UNI EN ISO 354 - Direttiva 2002/44/CE - Regolamento (UE) n. 305/2011 - Norma EN 13501-1

TENDE PER L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI
accumula
recupera
riutilizza

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

SOLO NEL 30% DELLA SUPERFICIE DELL'INTERA COPERTURA

ESPOSIZIONE NELLA FALDA SUD

In. 04 PAVIMENTI E CONTROSOFFITTI FONOASSORBENTI

PRINCIPIO DI FUNZIONAMENTO

I pavimenti fonoassorbenti sono progettati per ridurre il rumore da impatto e il rumore aereo, migliorando l'acustica degli ambienti interni. Funzionano attraverso strati di materiali speciali che assorbono e attenuano le onde sonore. Questi pavimenti utilizzano materiali come gomma, schiuma ad alta densità, sughero e tappeti tecnici che assorbono le vibrazioni e riducono la trasmissione del suono.
I controsoffitti fonoassorbenti sono progettati per ridurre il riverbero e migliorare l'acustica degli ambienti interni. Utilizzano pannelli realizzati con materiali fonoassorbenti come fibra minerale, schiuma acustica, lana di roccia o tessuti fonoassorbenti.

APPLICABILITÀ

I pavimenti e i controsoffitti fonoassorbenti sono utilizzati in diversi contesti:
Uffici: Per ridurre il rumore di fondo e migliorare la qualità acustica degli spazi di lavoro. **Scuole:** Per migliorare l'acustica delle aule e degli spazi comuni, favorendo l'apprendimento. **Sale conferenze e auditorium:** Per garantire una buona qualità del suono durante presentazioni ed eventi. **Studi di registrazione:** Per ottenere un'acustica ottimale durante le sessioni di registrazione. **Ristoranti e locali pubblici:** Per ridurre il rumore di fondo e migliorare l'esperienza dei clienti.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi:
Riduzione del rumore: Attenua significativamente il rumore da impatto e aereo. **Comfort:** Migliora il comfort acustico e la qualità dell'ambiente. **Versatilità:** Disponibili in vari materiali, colori e design per adattarsi a qualsiasi arredamento. **Durabilità:** Materiali resistenti che offrono lunga durata.
Svantaggi:
Costo: Potrebbero avere un costo iniziale elevato rispetto ai pavimenti tradizionali. **Installazione:** Richiedono una corretta installazione per massimizzare l'efficacia acustica. **Manutenzione:** Necessitano di manutenzione regolare per preservare le proprietà fonoassorbenti.

SINERGIE E INTERAZIONI

I controsoffitti fonoassorbenti possono essere utilizzati in combinazione con altre soluzioni acustiche per migliorare l'isolamento: **Pannelli fonoassorbenti per pareti:** Utilizzare insieme a pannelli fonoassorbenti per pareti per un isolamento completo. **Pavimenti fonoassorbenti:** Combinare con pavimenti fonoassorbenti per ridurre ulteriormente il rumore. **Arredamento:** L'uso di mobili imbottiti e tappeti fonoassorbenti può contribuire a ridurre la trasmissione del suono.

NORMATIVA DI RIFERIMENTO

Legge n. 157 del 9 luglio 1992, Decreto del Ministero dell'Ambiente del 18 dicembre 1992, Circolare del Ministero dell'Ambiente del 30 marzo 1993, UNI 11300-1:2014, UNI 11300-2:2014, UNI 11300-3:2014, UNI 11300-4:2014, Direttiva 2009/147/CE, Regolamento (UE) n. 1143/2014

PAVIMENTAZIONI ISOLATE PER L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola

COLORI COMPATIBILI

COTTO
BEIGE
MARRONE

SPECIFICHE TECNICHE

E' PREFERIBILE L'APPLICAZIONE LI DOVE L'ALTEZZA DEL VANO E' CONSIDERATA ABITABILE QUANTO VIENE AGGIUNTO L'ISOLAMENTO

In. 05 SCHIUME NANO-STRUTTURATE

PRINCIPIO DI FUNZIONAMENTO

Le schiume nano-strutturate fonoassorbenti sono materiali porosi progettati per assorbire il suono. La loro struttura comprende una matrice solida, che può essere costituita da polimeri, metalli o ceramiche, con pori di dimensioni nanometriche (1-100 nm). Il principio di funzionamento si basa sulla capacità dei pori di intrappolare e dissipare l'energia sonora, trasformandola in calore. La nano-strutturazione migliora l'efficacia fonoassorbente grazie all'elevata superficie specifica e alla distribuzione ottimale dei pori.

APPLICABILITÀ

Le schiume nano-strutturate fonoassorbenti sono utilizzate in diversi settori, tra cui: Per l'isolamento acustico di edifici, riducendo il rumore proveniente dall'esterno e migliorando il comfort abitativo, Nei veicoli, per ridurre il rumore interno e migliorare l'esperienza di guida, Per attenuare il rumore nelle cabine degli aerei, contribuendo a un ambiente più silenzioso e confortevole, All'interno di dispositivi elettronici, per ridurre le interferenze sonore e migliorare la qualità del suono, In teatri, studi di registrazione e sale conferenze, per migliorare la qualità acustica degli spazi.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: La struttura nanometrica permette un'eccellente capacità di assorbimento del suono. Le proprietà delle schiume possono essere modificate per adattarsi a esigenze specifiche, come diverse frequenze sonore. Sono materiali leggeri, ideali per applicazioni in cui il peso è un fattore critico.

Svantaggi:

La produzione può essere costosa a causa delle tecnologie avanzate necessarie per creare la nano-strutturazione. Alcune schiume potrebbero avere una durata limitata rispetto ai materiali tradizionali, richiedendo sostituzioni più frequenti. La produzione su larga scala può essere complessa e richiedere attrezzature specializzate.

Rischi: Le nanoparticelle potrebbero avere effetti sconosciuti sulla salute umana. È essenziale un controllo rigoroso durante la produzione e l'uso. La produzione e lo smaltimento delle schiume nano-strutturate devono essere gestiti correttamente per evitare impatti ambientali negativi.

SINERGIE E INTERAZIONI

Le schiume nano-strutturate fonoassorbenti possono essere utilizzate sinergicamente con altri materiali e tecnologie per migliorare le prestazioni complessive: Possono essere combinati con altri materiali per creare compositi avanzati con proprietà acustiche superiori. L'integrazione con altre nanotecnologie, come nanoparticelle o nanotubi, può potenziare ulteriormente le loro prestazioni fonoassorbenti. Possono migliorare l'isolamento acustico in edifici e infrastrutture, contribuendo a un maggiore comfort abitativo e lavorativo. In collaborazione con esperti di acustica, possono essere utilizzate per progettare spazi con qualità sonore ottimali, come sale concerti e studi di registrazione.

NORMATIVA DI RIFERIMENTO

Decreto Presidenziale 5 dicembre 1997, n. 507 - UNI EN ISO 11654:2009 - UNI EN ISO 354 - Direttiva 2002/44/CE - Regolamento (UE) n. 305/2011 - Norma EN 13501-1

SCHIUME PER L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : B - M
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola

COLORI COMPATIBILI

TUTTI

SPECIFICHE TECNICHE

L'APPLICAZIONE DI SCHIUME E' PREFERIBILE LI DOVE LA STRATIGRAFIA NON CONSENTE GRANDI SPESSORI DI ISOLAMENTO

In. 06 INTONACI ISOLANTI

PRINCIPIO DI FUNZIONAMENTO

Gli intonaci acusticamente isolanti sono progettati per migliorare l'isolamento acustico degli spazi, riducendo la trasmissione del suono attraverso le pareti e i soffitti. Questi intonaci sono formulati con materiali che assorbono e dissipano le onde sonore, come particelle di gomma, fibre minerali o additivi specifici. Il principio di funzionamento si basa sulla capacità di questi materiali di trasformare l'energia sonora in calore attraverso la frizione e la vibrazione, riducendo così il rumore trasmesso.

APPLICABILITÀ

Gli intonaci acusticamente isolanti sono utilizzati in vari contesti, tra cui: Per migliorare l'isolamento acustico delle abitazioni, riducendo il rumore proveniente dall'esterno e tra le stanze, Negli uffici e negli spazi commerciali, per creare ambienti più silenziosi e produttivi, In scuole, ospedali e altri edifici pubblici, per garantire un ambiente acustico ottimale per gli utenti, In teatri, studi di registrazione e sale concerti, per migliorare la qualità del suono e ridurre le riflessioni indesiderate, Per migliorare le proprietà acustiche di edifici storici o vecchi senza compromettere l'estetica originale.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Forniscono un'eccellente capacità di ridurre la trasmissione del suono e migliorare il comfort acustico degli spazi. Possono essere applicati facilmente come intonaci tradizionali, senza necessità di modifiche strutturali. Adatti per diverse superfici e ambienti, inclusi spazi interni ed esterni.

Svantaggi:

Alcuni intonaci acustici, specialmente quelli con additivi avanzati, possono essere più costosi rispetto agli intonaci tradizionali. La durabilità può variare a seconda della qualità del materiale e delle condizioni ambientali. Potrebbe essere necessario applicare uno strato relativamente spesso per ottenere le prestazioni acustiche desiderate.

Rischi:

Potrebbero non essere compatibili con tutti i tipi di superfici o materiali edilizi preesistenti. Un'applicazione non corretta può compromettere le prestazioni acustiche e la durabilità dell'intonaco. La produzione e lo smaltimento di alcuni materiali acustici possono avere impatti ambientali se non gestiti correttamente.

SINERGIE E INTERAZIONI

Gli intonaci acusticamente isolanti possono essere utilizzati sinergicamente con altri materiali e tecnologie per migliorare le prestazioni complessive: Possono essere combinati con altri materiali da costruzione, come pannelli fonoassorbenti, per migliorare ulteriormente l'isolamento acustico. In collaborazione con esperti di acustica, possono essere utilizzati per progettare spazi con qualità sonora ottimali. L'integrazione con tecnologie di costruzione sostenibile può contribuire a un ambiente più silenzioso e confortevole.

NORMATIVA DI RIFERIMENTO

Legge n. 157 del 9 luglio 1992, Decreto del Ministero dell'Ambiente del 18 dicembre 1992, Circolare del Ministero dell'Ambiente del 30 marzo 1993, UNI 11300-1:2014, UNI 11300-2:2014, UNI 11300-3:2014, UNI 11300-4:2014, Direttiva 2009/147/CE, Regolamento (UE) n. 1143/2014

INTONACI PER L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola

COLORI COMPATIBILI

SI PREDILIGE LA COLORAZIONE TIPICA DETERMINATA DAI PIANI DEL COLORE STABILITI DA NORMATIVA

SPECIFICHE TECNICHE

E' PREFERIBILE L'APPLICAZIONE NEI CASI DI MURATURE GIA' INTONACATE E NON A FACCIA VISTA

In. 07 INFISSI A TENUTA

PRINCIPIO DI FUNZIONAMENTO

Gli infissi sono progettati per ridurre la trasmissione del suono e migliorare il comfort acustico degli ambienti. Questi infissi impiegano diverse tecnologie e materiali per ottenere un'efficace barriera contro il rumore. Il principio di funzionamento si basa su:

- **Vetri Isolanti:** Utilizzano vetri doppi o tripli con spazi d'aria o gas inerti tra i vetri. Questo design riduce la trasmissione del suono, poiché i diversi strati e le camere d'aria agiscono come barriere acustiche.
- **Guarnizioni e Sigillature:** Sono dotati di guarnizioni e sigillature di alta qualità che impediscono infiltrazioni di suono lungo i bordi degli infissi. Queste guarnizioni sono realizzate in materiali elastici come silicone o EPDM, che garantiscono una chiusura ermetica e riducono le vibrazioni sonore.
- **Strutture Multi-Camera:** I telai degli infissi possono essere progettati con strutture a più camere per migliorare ulteriormente l'isolamento acustico. Le camere d'aria aiutano a dissipare le onde sonore e a ridurre la loro trasmissione.

APPLICABILITÀ

Gli infissi acusticamente isolanti sono utilizzati in vari ambiti, tra cui: Per ridurre il rumore esterno e migliorare il comfort abitativo, particolarmente utile in aree urbane o in prossimità di strade trafficate, Negli uffici, negozi e spazi commerciali, per creare ambienti di lavoro più silenziosi e produttivi, In scuole, ospedali e altre strutture pubbliche, per garantire ambienti tranquilli e favorevoli al benessere degli utenti, In teatri, studi di registrazione e sale concerti, per migliorare la qualità del suono e ridurre il rumore indesiderato, Per migliorare le proprietà acustiche di edifici storici o esistenti, senza compromettere l'aspetto architettonico.

VANTAGGI / SVANTAGGI / RISCHI

Vantaggi: Riduce significativamente la trasmissione del suono, migliorando la qualità acustica degli ambienti e riducendo il rumore esterno. Contribuisce a creare spazi più tranquilli e confortevoli, aumentando la qualità della vita e del lavoro. Adatti per vari tipi di ambienti e utilizzi, dall'ambito residenziale a quello commerciale e pubblico.
Svantaggi: Gli infissi acustici possono essere più costosi rispetto agli infissi standard, sia per l'acquisto che per l'installazione. Richiedono una installazione precisa e professionale per garantire l'efficacia dell'isolamento acustico. Gli infissi acustici possono essere più spessi e pesanti rispetto agli infissi tradizionali, il che può influenzare l'aspetto estetico e la struttura dell'edificio.
Rischi: Potrebbero non essere compatibili con tutte le strutture esistenti o richiedere modifiche significative durante la ristrutturazione. Le guarnizioni e i vetri possono richiedere manutenzione periodica per mantenere le prestazioni acustiche ottimali. La qualità dell'isolamento acustico può diminuire se non viene effettuata una manutenzione regolare e se le guarnizioni si usurano.

SINERGIE E INTERAZIONI

Possono essere combinati con pannelli fonoassorbenti sulle pareti e i soffitti per ottimizzare l'isolamento acustico degli ambienti. In collaborazione con esperti di acustica, possono essere integrati in progetti di design per ottenere la migliore qualità sonora possibile. Possono essere utilizzati insieme a sistemi di controllo del rumore, come barriere anti-rumore esterne o sistemi di isolamento per impianti HVAC.

NORMATIVA DI RIFERIMENTO

Decreto Presidenziale 5 dicembre 1997, n. 507 - UNI EN ISO 11654:2009 - UNI EN ISO 354 - Direttiva 2002/44/CE - Regolamento (UE) n. 305/2011 - Norma EN 13501-1

INFISSI L'INSONORIZZAZIONE DEI LOCALI

prevenzione acustica

COMPATIBILITÀ : M - A
REVERSIBILITÀ : B
INVASIVITÀ : M - A
AZIONI isola

COLORI COMPATIBILI

PER I CENTRI STORICI E' SEMPRE PREFERIBILE IL LEGNO, ANCHE IN COLORAZIONI SECONDO PIANO DEL COLORE

SPECIFICHE TECNICHE

L'APPLICAZIONE E' SEMPRE PREFERIBILE PER AVERE AMBIENTI ACUSTICAMENTE FAVOREVOLI

Un paese delle Madonie; ©Ente delle Madonie, 2023

Nonostante questi punti critici, l'adeguamento acustico è un investimento importante per la salute, il benessere e la qualità della vita delle persone. Con il continuo sviluppo di tecnologie innovative, la riduzione dei costi e l'aumento della consapevolezza, l'adeguamento acustico diventerà sempre più importante nella progettazione e nella gestione degli edifici e degli ambienti.

FATTORI TRAINANTI

Miglioramento della qualità della vita: Un ambiente con un buon comfort acustico contribuisce a migliorare la qualità della vita delle persone, riducendo l'inquinamento acustico e i suoi effetti negativi sulla salute e sul benessere.

Incremento della produttività: Un ambiente lavorativo con un buon comfort acustico può migliorare la concentrazione e la produttività dei lavoratori.

Miglioramento dell'apprendimento: Un ambiente scolastico con un buon comfort acustico può migliorare l'apprendimento degli studenti.

Tutela della salute: L'inquinamento acustico può avere effetti negativi sulla salute, come stress, disturbi del sonno, problemi di udito e malattie cardiovascolari. L'adeguamento acustico degli edifici e degli ambienti contribuisce a ridurre questi rischi.

Aumento del valore immobiliare: Un immobile con un buon comfort acustico ha un valore di mercato più alto rispetto a un immobile non adeguato acusticamente.

PUNTI CRITICI

Costi elevati: L'adeguamento acustico di un edificio può essere costoso, soprattutto per edifici complessi o di grandi dimensioni.

Difficoltà tecniche: L'adeguamento acustico può richiedere interventi invasivi sulla struttura dell'edificio, che possono essere complessi da realizzare e possono comportare disagi temporanei agli occupanti.

Mancanza di consapevolezza: Non tutti sono a conoscenza dell'importanza dell'adeguamento acustico e dei rischi dell'inquinamento acustico.

Barriere normative: In alcuni casi, le normative edilizie o gli standard di finanziamento possono ostacolare l'adeguamento acustico degli edifici.

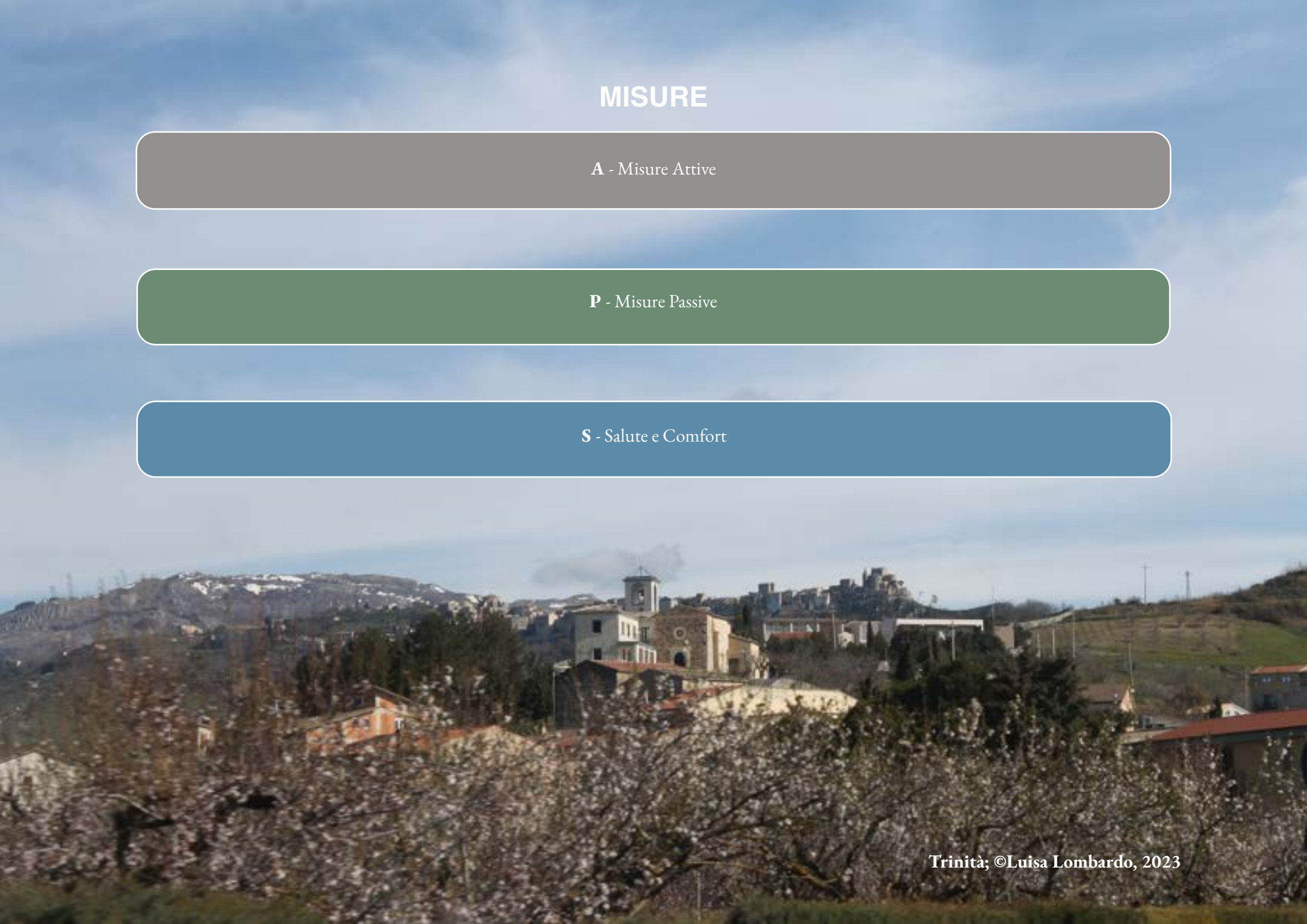
Mancanza di incentivi: In alcuni casi, non ci sono incentivi sufficienti per incoraggiare i proprietari o gli amministratori di condominio a effettuare interventi di adeguamento acustico.

MISURE

A - Misure Attive

P - Misure Passive

S - Salute e Comfort



Trinità; ©Luisa Lombardo, 2023

L'Atlante è una guida completa progettata per aiutare i professionisti e gli utenti a comprendere e implementare strategie efficaci per migliorare l'efficienza energetica e il comfort all'interno degli edifici.

Questo capitolo si suddivide in tre sezioni principali: Misure Attive, Misure Passive e Salute e Comfort.

Ciascuna di queste sezioni esplora diversi approcci e tecnologie che possono essere adottati per ottimizzare il consumo energetico, migliorare il benessere degli occupanti e garantire un ambiente salubre e sostenibile.

- **Misure Attive:**
  Questa sezione si concentra su tutte le azioni dirette o indirette volte a influenzare i consumi di energia all'interno degli edifici. Le misure attive includono l'uso di apparecchiature efficienti e strategie di gestione energetica che permettono di risparmiare denaro e ridurre il consumo energetico complessivo. È essenziale considerare anche l'energia rinnovabile per migliorare la sostenibilità e l'efficienza energetica.

- **Misure Passive:**
  Le misure passive mirano a mantenere una temperatura interna confortevole senza l'uso diretto di energia, attraverso l'ottimizzazione dell'involucro dell'edificio e altre strategie di gestione della domanda energetica. Questa sezione esplora come l'orientamento dell'edificio, l'isolamento termico, la ventilazione naturale e l'uso di materiali sostenibili possono contribuire a ridurre la domanda energetica e migliorare il comfort degli occupanti.

- **Salute e Comfort:**
  La qualità ambientale interna è cruciale per il benessere degli occupanti. Questa sezione esamina i vari fattori che influenzano la salute e il comfort all'interno degli edifici, come l'aria interna pulita, l'illuminazione naturale, il comfort termico e la limitazione dei campi elettromagnetici. Migliorare questi aspetti richiede un approccio olistico che tenga conto delle normative vigenti, delle tecnologie disponibili e delle esigenze degli utenti.

L'Atlante dei Misuratori offre una panoramica dettagliata delle migliori pratiche e delle tecnologie più avanzate per promuovere un ambiente costruito più efficiente, sostenibile e salubre.

San Mauro Castelverde; ©Luisa Lombardo, 2023

A - Misure Attive

A01 - Sistemi di misurazione e controllo
A02 - Centralizzazione dei contatori
A03 - Compensazione energetica
A04 - Soluzioni per l'efficienza dell'illuminazione
A05 - Ottimizzazione dell'uso dell'illuminazione
A06 - Cogenerazione elettrica e termica
A07 - Generazione termica mediante aerotermia
A08 - Produzione di energia elettrica da fonti rinnovabili
A09 - Prod. di energia elettrica con energie rinnovabili
A10 - Energia solare-termica per ACS e riscaldamento
A11 - Recupero di calore
A12 - Miglioramento dell'efficienza dei sistemi di climatizzazione
A13 - Soluzioni alternative per la climatizzazione
A14 - Uso razionale dell'aria condizionata
A15 - Centralizzazione degli impianti di climatizzazione
A16 - Teleriscaldamento e teleraffrescamento
A17 - Sistemi di distribuzione energetica efficienti
A18 - Eliminazione dello stand-by
A19 - Manutenzione dei grandi elettrodomestici
A20 - Serbatoi doppi
A21 - Aeratori e riduttori di flusso d'acqua

P - Misure Passive

P01 - Tetti verdi
P02 - Isolamento della copertura
P03 - Isolamento esterno
P04 - Isolamento interno
P05 - Eliminazione dei ponti termici
P06 - Riduzione delle infiltrazioni
P07 - Sostituzione dei vetri
P08 - Sostituzione degli infissi
P09 - Schermature solari
P10 - Muro di Trombe
P11 - Ventilazione naturale
P12 - Coperture e facciate ventilate

S - Salute e Comfort

S01 - Temperatura e umidità ottimali
S02 - Ventilazione e ricambio d'aria
S03 - Materiali da costruzione
S04 - Igiene e sanificazione
S05 - Isolamento acustico e vibrazioni
S06 - Condizionamento acustico
S07 - Illuminazione naturale
S08 - Illuminazione artificiale
S09 - Fornitura elettrica
S10 - Radiazioni elettromagnetiche a bassa frequenza
S11 - Radiazioni elettromagnetiche ad alta frequenza

Caccamo; ©Luisa Lombardo, 2023

Le misure attive, nell'ambito dell'efficienza energetica, comprendono tutte le azioni dirette o indirette volte a influenzare i consumi di energia. Il consumo energetico di un edificio è principalmente determinato dall'utilizzo di apparecchiature come l'aria condizionata (caldaie, pompe di calore, stufe, ecc.), dagli elettrodomestici (frigorifero, lavatrice, TV, microonde, computer, aspirapolvere...) e dall'illuminazione.

Esistono strategie che consentono di agire sul costo energetico sostenuto dal consumatore, permettendo di risparmiare denaro senza necessariamente ridurre il consumo energetico in sé. Questi risparmi possono poi essere reinvestiti in interventi mirati al risparmio energetico. Le misure attive più significative comportano direttamente il cambiamento di apparecchiature e/o sistemi che consumano energia.

Tuttavia, l'intervento non si limita alla mera sostituzione di un dispositivo con un altro più efficiente; è essenziale prevedere in anticipo quali misure passive saranno adottate, poiché queste influenzano la scelta del dispositivo stesso. Inoltre, una volta effettuata la sostituzione, è fondamentale garantire una corretta manutenzione dell'apparecchiatura e adottare comportamenti che favoriscano il risparmio energetico per ridurre il fabbisogno energetico complessivo dell'edificio.

Non meno importante è considerare le misure volte a promuovere l'utilizzo di energia rinnovabile. La riduzione della domanda e dei consumi di energia è cruciale per conseguire un reale risparmio energetico. Tuttavia, considerando il nostro attuale stile di vita, è improbabile prescindere completamente dai consumi energetici, soprattutto elettrici, in un edificio.

Pertanto, è essenziale che l'energia utilizzata provenga da fonti rinnovabili e locali per garantire una maggiore sostenibilità ed efficienza energetica dell'edificio in questione. Questa scelta contribuirà a ridurre l'impatto ambientale e ad accrescere la resilienza dell'edificio stesso, promuovendo un approccio più sostenibile alla gestione delle risorse energetiche.

Sistemi di misurazione e controllo

All'interno di un programma di gestione dell'energia, saremo in grado di conoscere in modo affidabile e immediato il consumo reale di un impianto con l'obiettivo di migliorare il risultato della sua progettazione, funzionamento, gestione dei consumi e manutenzione preventiva e predittiva, nonché disporre di dati per il calcolo, automazione, controllo automatico di riprogrammazione o semplice misurazione e verifica (M&V).

Salute

Con questa soluzione ridurremo drasticamente i consumi inutili, eviteremo perdite o malfunzionamenti degli asset e quindi minimizzeremo i possibili impatti delle macchine sulla nostra salute e su quella dell'edificio.

Comfort

Avendo il controllo automatico di tutti i sistemi, possiamo garantire un miglior grado di comfort e una minore preoccupazione per il dispendio elettrico dell'impianto, fornendo all'utente le conoscenze più necessarie.

Risparmio energetico o risparmio idrico

Conoscendo i punti in cui si consuma più energia, è possibile studiare come ridurli, programmare allarmi automatici, anticipare gli incidenti, ecc., e in questo modo farne un uso più responsabile.

Facilità di attuazione

Attraverso dispositivi collegati al contatore e un programma per computer possiamo monitorare i consumi in tempo reale. È complesso al momento dell'installazione e della programmazione, ma in seguito risparmia molte operazioni.

Ammortamento

Con una buona gestione dell'energia riusciamo a ridurre i costi ed essere in grado di rilevare tempestivamente le carenze dell'impianto. Senza dubbio è il modo per ridurre il rischio di mancato rimborso, evitando investimenti sbagliati.

Rispetto ambientale

Grazie a questo accorgimento si ottimizzano i consumi energetici e si elimina la maggior parte dei consumi superflui, con il quale l'impatto ambientale è minore, dovendo produrre meno energia.

Centralizzazione dei contatori

Con l'unificazione dei contatori è possibile risparmiare sulle tariffe e, grazie alla simultaneità tra vicini, ridurre la contrattazione congiunta del fisso con la società commerciale. Entrambi comportano un risparmio economico, ma in combinazione con le energie rinnovabili locali per l'autoconsumo condiviso, riduciamo anche il picco di domanda elettrica dell'edificio e della popolazione.

Salute

Per limitare le sorgenti di alta frequenza REM si raccomanda che i contatori non siano wifi. Ed è anche importante posizionarli lontano dalle aree di sosta.

Comfort

Per le persone sensibili, il loro sonno o la loro vita quotidiana possono essere disturbati dall'eccessiva vicinanza a fonti che generano REM, nel caso di contatori Wi-Fi situati in aree sensibili, che soffrono di mal di testa e altri effetti sulla salute.

Risparmio energetico o risparmio idrico

Non significa un miglioramento energetico diretto, solo economico.

Facilità di attuazione

Nell'edificio è installato un contatore aziendale generale, mentre ogni nucleo familiare dispone di un proprio contatore che monitora i consumi individuali, per determinare come sono distribuiti i pagamenti complessivi.

Ammortamento

Nell'unificazione dei contatori di un edificio, riduciamo ad un unico contratto con l'azienda, evitando di pagare più tasse ea tempo determinato. Con un costo molto contenuto e un risparmio economico diretto, il ritorno dell'investimento avviene in pochi mesi.

Rispetto ambientale

Non è un miglioramento diretto. Contribuisce solo a ridurre la domanda teorica di energia nelle ore di punta, magari riducendo l'immissione di combustibili fossili dal sistema di generazione nazionale.

Compensazione energetica

Installazione di batterie di condensatori statici o regolabili per ridurre il termine di energia reattiva (VArh) della bolletta elettrica. Questa è una misura che, principalmente, genera per noi risparmi finanziari che, successivamente, possono aiutarci a fare un piccolo investimento in efficienza.

Salute

Non si applica.

Comfort

Non si applica.

Risparmio energetico o risparmio idrico

Permette di ridurre le perdite elettriche generate nel trasporto e nella distribuzione dell'energia elettrica all'abitazione. Riduce anche la quantità di energia apparente richiesta e quindi riduce la generazione di elettricità alla fonte.

Facilità di attuazione

Qualsiasi elettricista qualificato può installare una batteria di condensatori. È una tecnologia matura e pienamente implementata. Non è necessario effettuare alcuna formalità o modifica del contratto con la società elettrica.

Ammortamento

Nei contratti con tariffa 3.0 o superiore come negozi, servizi, uffici,... con molto consumo di energia reattiva, l'investimento può essere recuperato nel primo anno con il risparmio del termine di energia reattiva. Nella maggior parte delle case, dove la tariffa contrattata è 2,0 o 2,1, questa misura non si applica.

Rispetto ambientale

Si registra una riduzione delle emissioni di CO_2 a seguito di una riduzione dell'utilizzo di combustibili fossili nella produzione di energia elettrica. C'è anche una riduzione della sezione trasversale del cablaggio dell'installazione interna, la caduta di tensione, ecc. I compensatori reattivi elettronici hanno un impatto inferiore rispetto ai tradizionali banchi di condensatori.

Soluzione per l'efficienza dell'illuminazione

Sostituzione diretta delle lampade termiche, con lampade a LED senza limiti tecnologici (SLT). Con questa soluzione si può ottenere un risparmio di efficienza fino al 96% rispetto alle classiche lampade ad incandescenza, fino al 90% rispetto alle lampade alogene o fino al 60% rispetto alle lampade a fluorescenza.

Salute

Il LED di qualità SLT emette radiazioni elettromagnetiche praticamente impercettibili a una distanza di 40cm. Eviteremo anche il lampeggiamento prematuro. Entrambi i maggiori impatti sulla salute di questa tecnologia.

Comfort

La mancanza di forti REM (per le persone sensibili) e lo sfarfallio di un buon LED provoca meno mal di testa e stanchezza agli occhi, soprattutto dove abbiamo le luci accese per molte ore e quando sono installate sopra le nostre teste.

Risparmio energetico o risparmio idrico

Il LED di qualità deve essere A++ e SLT, è la tecnologia più efficiente sul mercato dell'illuminazione. Grazie al suo basso consumo elettrico a fronte di un flusso luminoso superiore e dell'assenza di emissione di calore.

Facilità di attuazione

La sostituzione è semplice, nella maggior parte dei casi basta svitare la lampadina e avvitare quella nuova. Nel caso di lampade con riflettore bi-pin, si consiglia di sostituire l'intero sistema con lampade GU10 con apparecchiature esterne.

Ammortamento

LED SLT si ripaga in un periodo di tempo più breve rispetto a qualsiasi altra tecnologia. Grazie al suo basso consumo e alla grande quantità di ore di emivita, consente di risparmiare molte ricariche e, quindi, molti rifiuti elettronici.

Rispetto ambientale

Se cerchiamo lampade LED SLT, riparabili e aggiornabili, riusciremo a ridurre l'impatto ecologico che subiamo dalla quantità di rifiuti elettronici. La durabilità dovrebbe essere uno dei principali contributi dei LED.

Ottimizzazione dell'uso dell'illuminazione

Riduzione dei punti luce o miglioramento tecnologico per ogni applicazione, con sostituzione di apparecchi e/o lampade senza limiti tecnologici (SLT) più idonei. Un tecnico specializzato può ottenere un'illuminazione di qualità superiore, con più luce dove serve e senza illuminare eccessivamente nessuna area.

Salute

Riducendo i punti luce, la loro potenza o studiando dove è meglio installarli, la radiazione elettromagnetica emessa è minore, e dobbiamo cercare di localizzarli a più di 40 cm di distanza dai nostri organi cavernosi. Anche la qualità della luce può essere migliorata.

Comfort

Una maggiore uniformità nell'illuminazione ambientale di una stanza in cui la vista è concentrata, mette più a proprio agio le persone e rilassa maggiormente la vista. Dove è necessario il contrasto, si cercherà l'illuminazione d'accento o di posizione.

Risparmio energetico o risparmio idrico

In questo caso si ottengono entrambe le cose, efficienza, ma soprattutto un miglioramento dell'efficacia, sfruttando il fatto che LED SLT A++ è la tecnologia che fa risparmiare di più essendo puntini molto piccoli e ognuno può mandare la luce dove si trova necessario.

Facilità di attuazione

Molte volte la ricerca di un'illuminazione efficace non è così facile da attuare come quella dell'efficienza. È necessario un esperto in grado di determinare la soluzione migliore con conoscenze tecniche e tutte le possibili soluzioni.

Ammortamento

Ottenendo una corretta illuminazione, con meno potenza e meno punti luce LED SLT, il tuo investimento è inferiore. Solitamente unendo efficienza ed efficacia è possibile ammortizzare in poco più di un anno.

Rispetto ambientale

Utilizzando la luce LED SLT adatta e più durevole, riduciamo drasticamente la quantità di rifiuti elettronici. Anche le emissioni di CO2 riducendo i consumi a meno della metà e la produzione 40 volte inferiore.

Poiché il dispositivo di consumo più efficiente è quello che spegniamo, dobbiamo ridurre il tempo di accensione delle fonti di luce artificiale. A tale scopo, la migliore tecnologia esistente è il LED SLT, sfruttando il fatto che è il migliore per essere regolato, temporizzato o rilevato automaticamente dalla presenza, dalla prossimità o dalla cattura della luce naturale.

Salute

La lampadina spenta o regolata a potenza minore è quella che consuma meno e inquina il nostro habitat. La cosa più salutare è sfruttare la luce solare naturale, ma quando non può esserlo, la luce artificiale minima necessaria.

Comfort

L'occhio umano è più adatto alla luce solare e i suoi cicli regolano il nostro orologio interno. Con la regolazione si può migliorare il comfort visivo, adattando la quantità di luce al piacere degli utenti, con identica efficienza.

Risparmio energetico o risparmio idrico

Regolando l'intensità o il tempo di utilizzo si risparmia la maggior quantità di energia elettrica. Può essere la soluzione più efficace di tutte in esempi come i precedenti, dove la reale necessità di illuminazione è ridotta.

Facilità di attuazione

Attualmente esiste una grande diversità di tecnologie che consentono la regolazione dei corpi illuminanti, come sensori di presenza o prossimità, fotosensori, temporizzatori o anche sistemi di controllo automatico con regolatori.

Ammortamento

Unendo le schede precedenti e riducendo i tempi di utilizzo e regolazione, l'ammortamento può diventare inferiore al semestre. Ad esempio, nei bagni pubblici, nei parcheggi, nelle scale, nei magazzini o nei corridoi, è tipico sostituire le lampadine termiche. Riducendo i tempi di accensione e regolazione si ottiene un risparmio di circa il 97%.

Rispetto ambientale

Grazie alla riduzione delle ore di consumo e all'allungamento della durata delle lampade, l'impatto ambientale è minore. Rilavorazioni ridotte creano meno sprechi producendo fino a 20 volte meno.

La cogenerazione consiste nella generazione simultanea di energia elettrica (elettricità) ed energia termica (calore) a partire da energia primaria. Questa energia primaria è solitamente ottenuta attraverso la combustione di combustibili fossili come il gas, anche se questo può essere parzialmente o totalmente sostituito da energie rinnovabili come la biomassa.

Salute

Non fornisce miglioramenti in questa sezione.

Comfort

Non fornisce miglioramenti in questa sezione.

Risparmio energetico o risparmio idrico

Per quanto riguarda un sistema energetico dove solo il calore è ottenuto da combustibili fossili (situazione usuale), questa soluzione offre prestazioni molto più elevate. Inoltre, generando elettricità nello stesso punto di consumo, si evitano le perdite elettriche dovute al trasporto e alla distribuzione.

Facilità di attuazione

Poiché è necessario intervenire nell'impianto di gas, luce e anche acqua, occorrerà un progetto ingegneristico e l'intervento di tecnici specializzati in cogenerazione. La cogenerazione è spesso associata a strutture comunitarie, dove è richiesto il consenso dei vicini e altri tipi di licenze.

Ammortamento

La sostituzione di una caldaia centralizzata a gasolio con un impianto di cogenerazione a metano permette di generare un grande risparmio. Inoltre, ci permette di ridurre la nostra dipendenza dall'elettricità dall'esterno, potendo ridurre notevolmente la spesa sulla bolletta elettrica.

Rispetto ambientale

Il fatto di aumentare le prestazioni energetiche utilizzando la stessa quantità di combustibile fossile genera già un risparmio di emissioni di CO2. Se, inoltre, sostituiamo i combustibili fossili con la biomassa, il rispetto ambientale è molto maggiore.

Produzione di energia elettrica da fonti rinnovabili

Produzione di acqua calda/fredda (climatizzazione e ACS) con un impianto ad alta efficienza che utilizza l'aria esterna come mezzo di scambio termico attraverso una pompa di calore. La distribuzione dell'energia all'interno della casa può essere effettuata per via aerea o per acqua.

Salute

La distribuzione dell'aria condizionata incorpora filtri per il trattamento dell'aria in entrata, e permette di scegliere la fonte dell'aria (interna/esterna). Se la distribuzione dell'energia avviene attraverso l'acqua, non vi è ingresso di aria dall'esterno.

Comfort

Se la distribuzione è per via aerea, si possono creare correnti d'aria. Se la distribuzione è ad acqua (riscaldamento a pavimento, radiatori a bassa temperatura,...), il comfort è maggiore. Il meccanismo esterno è simile all'aria condizionata (rumore, espulsione d'aria,...).

Risparmio energetico o risparmio idrico

La sostituzione di una pompa di calore e di una caldaia convenzionali per l'ACS con una pompa di calore aerotermica aria-aria ad alta efficienza può generare fino all'80% di risparmio energetico in estate e fino al 20% in inverno.

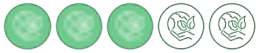
Facilità di attuazione

Si consiglia di eseguire un progetto per garantire che il progetto dell'impianto sia conforme alle esigenze di climatizzazione e ACS. L'installazione deve essere eseguita da un tecnico specializzato.

Ammortamento

Quando sostituiamo le caldaie convenzionali che funzionano a gas o diesel, o le stufe elettriche, il recupero dell'investimento è a brevissimo termine.

Rispetto ambientale



Riduciamo il consumo di combustibili fossili e/o lo spreco di energia dovuto ad apparecchiature inefficienti. Se il consumo elettrico delle apparecchiature viene coperto con elettricità di origine fotovoltaica, possiamo ridurre ancora di più l'impronta, poiché possiamo accumulare energia elettrica in eccesso sotto forma di caldo e freddo.

Prod. di energia elettrica con energie rinnovabili

Generazione di energia elettrica da pannelli fotovoltaici e/o minieolici posti su tetti, tetti o zone soleggiate e/o ventose. L'elettricità generata può essere immagazzinata in batterie al litio, Fe-Ni o piombo-acido, tra le altre.

Salute

Non fornisce miglioramenti in questa sezione. Tuttavia, la generazione di elettricità attraverso energie rinnovabili ci consente di ridurre l'uso di combustibili fossili e migliorare la qualità dell'aria in cui questa energia viene generata.

Comfort

Bisogna fare attenzione nella scelta dell'ubicazione degli aerogeneratori per evitare disturbi dovuti al loro rumore e vibrazioni. I pannelli fotovoltaici possono fungere da tende da sole e generare ombra in estate. Ti permette di essere sovrano della tua stessa energia.

Risparmio energetico o risparmio idrico

Se utilizziamo le batterie possiamo sostituire il 100% dell'energia elettrica consumata dalla rete (con un mix rinnovabile vicino al 50%) con elettricità "verde". Inoltre, generare la nostra elettricità ci consente di evitare perdite di elettricità nelle linee di trasmissione e distribuzione.

Facilità di attuazione

È necessario disporre di tetti soleggiati e rivolti a sud (+-90o), oppure tetti con altezza sufficiente, senza edifici/ostacoli intorno. Richiederà l'intervento di tecnici specializzati e in molti casi il permesso della comunità. La legalizzazione dipende dalla compagnia di distribuzione elettrica.

Ammortamento

Così come i pannelli fotovoltaici sono scesi molto di prezzo, la tecnologia delle piccole turbine eoliche è ancora molto costosa. L'investimento nel fotovoltaico può essere recuperato in meno di 10 anni in negozi e uffici.

Rispetto ambientale

Le energie rinnovabili sono essenziali per ridurre la nostra dipendenza dalle risorse energetiche non rinnovabili (fossili e nucleari) e promuovere la sostenibilità nella gestione delle risorse naturali. Inoltre ci permettono di autoprodurre energia elettrica nello stesso punto di consumo e di ridurre l'inquinamento atmosferico.

Energia solare-termica per ACS e riscaldamento

Produzione di acqua calda tramite sistemi di captazione solare. L'accumulo di acqua calda può essere utilizzato per ACS e/o riscaldamento e può essere interconnesso con altre tecnologie. Ideale per il riscaldamento centralizzato in comunità di vicini o con termosifone in case unifamiliari.

Salute

Riduce il consumo di energia da combustibili fossili, riducendo le emissioni inquinanti.

Comfort

Possono essere facilmente implementati sistemi di riscaldamento centralizzato che ci evitano di mettere apparecchiature all'interno della casa. In alcuni casi può essere valorizzato il fatto di avere autonomia termica e non dipendere da alimentazioni esterne.

Risparmio energetico o risparmio idrico

Le elevate prestazioni di questa tecnologia, utilizzata come supporto per le caldaie ad alto rendimento, consentono di ridurre i consumi energetici del 35% rispetto alle tradizionali caldaie a gas senza supporto solare-termico.

Facilità di attuazione

È necessario assumere tecnici specializzati sia per quanto riguarda la progettazione dell'impianto che per la sua realizzazione. Nelle strutture comunitarie sarà richiesto il consenso dei vicini (nelle grandi ristrutturazioni potrebbe essere obbligatorio) e una licenza di attività. Necessita di una manutenzione annuale per garantirne il corretto funzionamento.

Ammortamento

Aiuta anche a proteggere la membrana impermeabilizzante. Completato con un'ulteriore soluzione di isolamento termico esterno, migliora notevolmente le prestazioni termiche del tetto.

Rispetto ambientale

Attrezzature realizzate con materiali disponibili e locali, che lavorano con l'energia del sole, ci permettono di ridurre sensibilmente le emissioni di CO2. Con una buona manutenzione annuale, gli impianti possono durare molti anni.

Recupero di calore

Apparecchiatura di recupero termico che sfrutta l'energia residua proveniente dall'abitazione, per incorporarla parzialmente o integralmente nel ciclo di climatizzazione. Lo scambiatore di calore permette lo scambio di calore tra l'aria interna che viene estratta con l'aria esterna che viene immessa, senza miscelare l'aria proveniente dai due circuiti.

Salute

Il recuperatore di calore fa parte di un sistema di ventilazione che incorpora filtri dell'aria, in modo che la qualità dell'aria all'interno della casa migliori notevolmente. Il suo design consente di regolare il numero di ricambi d'aria e controllare il livello di CO2, particelle e inquinanti nell'aria.

Comfort

Il recuperatore di calore impedisce l'incorporazione di aria fredda (o calda, in estate) nell'abitazione. Pertanto, vi è un significativo miglioramento del comfort termico. È necessario prestare attenzione alla progettazione e all'installazione per evitare possibili disagi dovuti alla velocità dell'aria o al rumore.

Risparmio energetico o risparmio idrico

Molto alto. In modo passivo è possibile recuperare fino al 40% del consumo dell'impianto di climatizzazione, anche se l'impianto ha un consumo elettrico dovuto ai ventilatori. Maggiore è il gradiente termico, maggiore è la sua efficienza. Più basso è il flusso, maggiore è l'efficienza.

Facilità di attuazione

Deve essere incluso durante la fase di progettazione. Successivamente, potremmo avere problemi di spazio a causa dell'elevato numero di condotti di ventilazione e attrezzature. I filtri devono essere cambiati periodicamente.

Ammortamento

Interessante ammortamento per i grandi consumatori di energia di climatizzazione. Negli ambienti in cui l'installazione del recuperatore è immediata per il fatto che disponiamo di spazio sufficiente e le condotte di ventilazione sono facilmente accessibili, l'ammortamento può essere inferiore a 3 anni.

Rispetto ambientale

I materiali utilizzati sono molto standardizzati e abbondanti. Lo scambiatore ha una vita utile molto lunga (ad eccezione dei filtri).

Miglioramento dell'efficienza dei sistemi di climatizzazione

Produzione di acqua calda tramite sistemi di captazione solare. L'accumulo di acqua calda può essere utilizzato per ACS e/o riscaldamento e può essere interconnesso con altre tecnologie. Ideale per il riscaldamento centralizzato in comunità di vicini o con termosifone in case unifamiliari.

Salute

I vecchi condizionatori utilizzano refrigeranti già vietati perché tossici. Nel tempo, i filtri e i condotti si deteriorano, portando a una qualità dell'aria interna più scadente.

Comfort

I nuovi dispositivi A+++ sono più silenziosi, sia l'unità interna che il compressore installato all'esterno (coperto). I sistemi di controllo della temperatura di setpoint migliorano la sensazione termica in ogni momento.

Risparmio energetico o risparmio idrico

Le attuali macchine A/C inverter e COP > 6 traducono 1 KW elettrico equivalente in 6 KW termici, rispetto a vecchie macchine che, sommando il loro degrado, possono lavorare al di sotto di un COP < 1,4.

Facilità di attuazione

La sua installazione è simile a quella di un qualsiasi dispositivo convenzionale, quindi è consigliabile rivolgersi a un tecnico specializzato.

Ammortamento

Le nuove tecnologie incorporano il sistema inverter che aiuta, insieme al miglioramento delle prestazioni (COP), a ridurre il consumo energetico. Se sostituiamo una vecchia macchina possiamo ammortizzare in meno di 10 mesi di utilizzo.

Rispetto ambientale

I refrigeranti liquidi tossici dei vecchi compressori, già vietati dalle normative, devono essere monitorati. Le macchine attuali possono lavorare con refrigeranti naturali o non dannosi per l'ambiente, senza ridurne le prestazioni.

I ventilatori e i dispositivi di raffreddamento evaporativo sono alternative ai sistemi di raffreddamento a compressione come l'aria condizionata convenzionale. L'uso più appropriato di una soluzione o dell'altra dipenderà dalle condizioni e dagli usi dell'edificio e dell'ambiente.

Salute

Entrambi i sistemi sono innocui per la qualità dell'aria e non utilizzano prodotti tossici. I ventilatori muovono solo aria. Un sistema evaporativo rinnova sempre l'aria e migliora le condizioni idrotermali. Entrambi sono più sani dell'aria condizionata, che comprime sempre la stessa aria.

Comfort

L'innovazione dei dispositivi evaporativi risiede nel riprodurre l'effetto della brezza marina, creando un ambiente fresco, pulito e salubre. Il classico ventilatore non riduce la sensazione termica, ma fa circolare l'aria quando non è in movimento. È necessario prestare attenzione quando si utilizzano entrambi, in quanto possono aggiungere rumore all'ambiente.

Risparmio energetico o risparmio idrico

Hanno un consumo energetico molto basso rispetto a un sistema A/C e possono essere soluzioni altrettanto o più efficaci in molte applicazioni. I sistemi di raffreddamento evaporativo, ad esempio, possono richiedere solo 1 KW per raffreddare 200 m2.

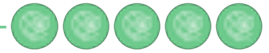
Facilità di attuazione

I ventilatori sono sistemi facili da installare. Per i sistemi di raffrescamento evaporativo si consiglia l'intervento di un tecnico specializzato, in quanto la canalizzazione dell'aria è simile a quella di un tradizionale impianto di climatizzazione.

Ammortamento

Entrambi gli impianti hanno un costo inferiore rispetto ad un impianto A/C, quindi si ripagano da soli in tempi brevissimi. Nel caso dei sistemi di raffrescamento evaporativo, maggiori sono gli spazi in cui sono installati, più velocemente si recupera l'investimento.

Rispetto ambientale



Entrambi i sistemi utilizzano solo aria e/o acqua. C'è anche la possibilità di trovare ventilatori realizzati con materiali riciclati.

L'aria condizionata è regolata, nella maggior parte degli ambienti, con termostati o con telecomandi. Si raccomanda di selezionare 21°C in inverno e 26°C in estate. Dopo che la stanza raggiunga la temperatura indicata e, se non è la nostra temperatura di comfort, aumentare o diminuire rispettivamente di un grado fino al raggiungimento della temperatura desiderata. Si consiglia di non superare i 23°C in inverno o di non scendere sotto i 23°C in estate. Per dormire in inverno, seleziona tra 15 e 17 gradi..

Salute

I parametri di selezione, temperatura, umidità e velocità dell'impulso finiscono per avere un impatto sulla salute. È necessario trovare l'equilibrio tra attività, abbigliamento e selezione appropriata di questi parametri.

Comfort

Climatizzazione tramite sistemi di distribuzione dell'aria, ad es. di tipo split, possono generare disagio. La selezione della velocità dell'impulso aereo intensifica questa percezione. Si consiglia di selezionare la velocità minima per evitare correnti d'aria.

Risparmio energetico o risparmio idrico

Per ogni grado, il risparmio energetico rappresenta circa il 5-7% nel condizionamento. La normativa, nei locali e negli uffici, limita la temperatura a 21°C in inverno ea 26°C in estate, per motivi di risparmio energetico.

Facilità di attuazione

Se ci sono persone sedute e in movimento nella stessa stanza, l'abbigliamento di ognuna di esse deve essere adatto alla temperatura e alla velocità prescelta. È importante fare una buona manutenzione e pulizia dei filtri.

Ammortamento

Si tratta di una misura di costo pari a 0 € e quindi l'ammortamento è immediato.

Rispetto ambientale

Le emissioni di CO_2 sono ridotte a seconda della fonte che genera l'energia: elettricità, gas naturale, gasolio, ecc.

Centralizzazione degli impianti di climatizzazione

Centralizzare la produzione condivisa degli impianti di climatizzazione (Riscaldamento, ACS ed eventualmente A/C ad assorbimento) di un edificio residenziale può essere la misura di asset che maggiormente riduce i costi delle forniture in ogni abitazione, sia di generazione che di manutenzione dell'impianto stesso . Possono essere caldaie a gas, a biomassa o aerotermiche, a seconda di dove sono installate.

Salute

Centralizzando le suddette forniture e la loro manutenzione, si può ridurre il rumore, si evitano perdite di gas o acqua (umidità) nelle abitazioni (che nuocciono alla salute) e quindi si minimizza anche la loro pericolosità.

Comfort

Nonostante la produzione centralizzata dell'edificio, ogni nucleo familiare ha la possibilità di controllare la temperatura interna desiderata. Inoltre la produzione di ACS sarà più fluida e l'acqua meno stagnante.

Risparmio energetico o risparmio idrico

La produzione condivisa del clima significa, rispetto ai singoli impianti, fino al 90% di risparmio energetico e fino al 60% nell'investimento iniziale. Consente inoltre un risparmio nella manutenzione dell'impianto globale fino al 55%.

Facilità di attuazione

Sebbene il generatore sia installato nelle aree comuni dell'edificio, la sua canalizzazione non è diversa da quella di un qualsiasi impianto di climatizzazione individuale, che potrebbe essere utilizzato in larga misura.

Ammortamento

Maggiore è la domanda in numero di vicini, più efficace è il sistema condiviso e più efficienti sono le macchine di grandi dimensioni, dato che l'inerzia di ogni vicino è meglio utilizzata. Quindi possiamo ammortizzare in <2,5 anni.

Rispetto ambientale

Sia il fatto di essere un'unica macchina invece di tante, sia la durata della macchina grande, significa che produciamo meno rifiuti futuri. E grazie alla suddetta efficienza ed efficacia, è possibile ridurre le emissioni di CO2.

Per quanto riguarda il foglio precedente, possiamo ancora migliorare se abbiamo la possibilità di collegarci a una rete di distribuzione del freddo e del caldo (DHC). La centralizzazione dell'impianto di climatizzazione non di uno, ma di più edifici in un territorio, può ridurre ulteriormente i costi derivanti dalla generazione termica e dalla manutenzione dell'impianto, e sfruttare ancora meglio la contemporaneità.

Salute

In questo caso, i sistemi non si trovano nemmeno nell'edificio, ma sono lontani dai loro vicini, il che massimizza i precedenti benefici di rumore, sicurezza e salute dell'edificio.

Comfort

Con il sistema DHC si ottiene una fornitura istantanea di acqua calda e fredda, ancora più affidabile del precedente, il che significa un miglioramento del comfort, senza dover aspettare che si riscaldi, sprecando acqua.

Risparmio energetico o risparmio idrico

La produzione centralizzata su scala urbana è molto più redditizia della produzione individuale sia per l'abitazione che per l'edilizia. Il risparmio energetico è fino al 95%. Il resto deve essere negoziato.

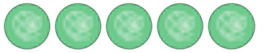
Facilità di attuazione

La sua connessione dipende dall'ubicazione di un vicino impianto di produzione di DHC e di una vicina diramazione della rete di distribuzione. D'altra parte, è possibile utilizzare gran parte delle tubazioni interne convenzionali dell'edificio.

Ammortamento

Idealmente è un'ottima soluzione in termini di risparmio, ma il rimborso finale dipenderà dall'investimento iniziale per l'allacciamento alla filiale più vicina e dal prezzo di energia e manutenzione concordato con il fornitore.

Rispetto ambientale



Solitamente questi impianti DHC utilizzano energie rinnovabili (consigliamo di verificare) come biomasse o rifiuti, con le quali il loro consumo di materia prima è inferiore, ecologico e più pulito rispetto all'autoproduzione.

I pavimenti, i battiscopa o le pareti radianti sono sistemi di distribuzione dell'energia che funzionano a basse temperature (<45°C) e che consentono una distribuzione omogenea della climatizzazione. Sebbene possiamo trovare sistemi di riscaldamento radianti elettrici, i sistemi più efficienti sono quelli che funzionano con acqua, riscaldamento in inverno e raffrescamento in estate.

Salute

Il suo funzionamento a bassa temperatura fa sì che non si generino correnti d'aria, quindi l'ambiente non si secca e non vi è movimento di polveri o microrganismi.

Comfort

La distribuzione del calore con questo sistema è molto più omogenea e confortevole, poiché è un'intera superficie che emette calore e non un solo punto, come nel caso dei termosifoni.

Risparmio energetico o risparmio idrico

Questi sistemi funzionano solitamente a basse temperature (35°-40°), a differenza dei radiatori convenzionali (60°-70°). La buona omogeneizzazione dell'aria condizionata vicino al pavimento permette di ridurre la quantità di energia necessaria per riscaldare l'ambiente e permette di abbassare la temperatura del termostato di 1 o 2 gradi mantenendo la sensazione termica.

Facilità di attuazione

Nella maggior parte dei casi, le installazioni vanno all'interno dell'involucro o sotto il pavimento. Agibile solo in fase di costruzione o di importanti ristrutturazioni. I plinti radianti sono un sistema che ci permetterebbe di evitare grandi ristrutturazioni. È necessario assumere specialisti per garantire i vantaggi di comfort di questi sistemi.

Ammortamento

Nelle grandi ristrutturazioni, si deve tener conto del costo opportunità dell'attuazione di questa misura nell'ambito della ristrutturazione complessiva dell'edificio. Dovremmo anche tener conto del fatto che non richiede quasi nessuna manutenzione.

Rispetto ambientale

La misura da sola ci consente di ridurre la domanda di energia e, quindi, le emissioni di CO2. Inoltre, ci sono produttori che garantiscono più di 25 anni dei materiali. Se i tubi utilizzati sono di materiale riciclato, stiamo riducendo un po' di più l'impatto ambientale.

Eliminazione dello stand-by

La maggior parte dei dispositivi elettronici continua a consumare energia quando li spegniamo con l'interruttore e rimaniamo collegati. Ad esempio, in una tipica abitazione il 10%* (IDAE, SECH-SPAHOUSEC) del consumo di elettrodomestici proviene dallo stand-by. Per facilitare l'eliminazione di questo consumo "fantasma", si consiglia di collegare i dispositivi elettronici a prese multiple dotate di interruttore e di spegnerli quando non vengono utilizzati.

Salute

Si consiglia di scollegare i dispositivi e non lasciarli in stand-by.

Comfort

Le strisce rendono più accessibili le prese, solitamente posizionate in basso rispetto al pavimento. Collegare più dispositivi alla stessa presa multipla rende più facile e veloce accenderli e spegnerli. Questo miglioramento del comfort ergonomico non è apprezzato.

Risparmio energetico o risparmio idrico

Il consumo di elettricità risparmiato per dispositivo dipenderà dalle ore in cui è effettivamente acceso senza utilizzarlo. Un router su 24 ore può consumare 250 Wh/giorno, ovvero quasi 100 kWh/anno. Il suo stand-by sarebbe 1/2 di questo consumo. Se aggiungiamo lo stand-by del televisore, dello stereo, del cordless,... il risparmio energetico è davvero notevole.

Facilità di attuazione

Sebbene l'incorporazione di prese multiple non sia complicata, scollegare è un'abitudine quotidiana che deve essere acquisita. Gli interruttori orari possono essere utilizzati per quei dispositivi programmabili. Si raccomanda che le prese multiple incorporino un dispositivo di protezione da sovratensione per una maggiore protezione delle apparecchiature.

Ammortamento

Meno di un anno nella maggior parte dei casi. Dipenderà dal numero di elementi e dalle buone abitudini. A titolo di esempio, la spesa annua di energia consumata dallo stand-by di 5 dispositivi è di circa 31€. Se spegniamo tutti e 5 i dispositivi per 8 ore risparmieremo circa 10€/anno.

Rispetto ambientale

Questa misura implica, con un risparmio medio per famiglia di 100kWh/anno, un risparmio di oltre 68.407.800 kWh/anno nella sola città di Barcellona, che rappresenta una riduzione di 22.642 TnCO2/anno.

Manutenzione di grandi elettrodomestici

Una buona manutenzione degli elettrodomestici può farci risparmiare inutili consumi energetici. La priorità dovrebbe essere data ai grandi elettrodomestici: frigorifero, lavatrice, lavastoviglie, aria condizionata.

Salute

Una buona manutenzione può prevenire la presenza di particelle nell'aria, la destabilizzazione della catena del freddo nei frigoriferi, la proliferazione di microrganismi e batteri nelle lavatrici e nelle lavastoviglie.

Comfort

Una buona manutenzione eviterà inutili rumori, perdite d'acqua e cattivi odori.

Risparmio energetico o risparmio idrico

Il risparmio di energia elettrica con la manutenzione, sia in casa che nei locali commerciali, può rappresentare il 5% del consumo totale di energia elettrica.

Facilità di attuazione

Applicazione di buone abitudini da parte dell'utente. La lettura dei manuali d'uso e le informazioni che possiamo trovare nei cataloghi di buone pratiche ci permettono di eseguire noi stessi questa manutenzione.

Ammortamento

Non si applica, poiché non ci sono costi finanziari associati diversi dal nostro tempo.

Rispetto ambientale

Una buona manutenzione degli elettrodomestici ci consente di prolungarne la vita utile e quindi di ridurre il consumo di risorse naturali per la produzione di nuove apparecchiature.

Serbatoi doppi

Sostituzione del meccanismo di svuotamento della cassetta o sostituzione totale della cassetta mediante l'installazione di un efficiente meccanismo a doppio scarico. Attualmente sono disponibili sul mercato serbatoi a doppio scarico da 6l/3l e 4,5l/2,5l. Nel caso di riforme o risanamenti è necessario precisare le caratteristiche del doppio discarico.

Salute

Non si applica.

Comfort

Non si applica.

Risparmio energetico o risparmio idrico

Il risparmio idrico nel wc può rappresentare il 60%, se attualmente abbiamo installate vecchie cassette, da 12 l, e il 21% se sostituiamo un doppio scarico da 6 l/3 l con quello da 4,5 l/ 2,5 l Il risparmio idrico annuo può raggiungere i 14.600 l di acqua per persona.

Facilità di attuazione

Sebbene la sostituzione sia semplice, si consiglia di farla eseguire da un installatore. Esistono meccanismi universali a doppia scarica.

Ammortamento

Il periodo di ammortamento è breve, 1-3 anni, ma variabile a seconda della capacità della cassetta da sostituire e di quella installata, del meccanismo e dell'uso che si fa di ogni singolo wc.

Rispetto ambientale

Ricorda che l'acqua risparmiata è la conservazione di una risorsa naturale.
Inoltre, l'acqua risparmiata non deve essere resa potabile, distribuita o depurata e, quindi, gli impatti associati a questi processi sono ridotti. I materiali utilizzati sono di lunga durata.

Aeratori e riduttori di flusso d'acqua

Incorporazione di elementi nell'impianto idraulico per ridurre il consumo di acqua fredda e calda. Gli aeratori sono incorporati nei rubinetti e nei riduttori di flusso dell'impianto idraulico. Si raccomanda che i rubinetti abbiano una portata massima inferiore a 8 l/minuto.

Salute

Non si applica.

Comfort

Non si applica.

Risparmio energetico o risparmio idrico

Il risparmio idrico annuo varierà notevolmente a seconda della portata prima che la misura venga attuata e può rappresentare una riduzione del 50% del consumo idrico a quel punto. Quando questi rubinetti forniscono acqua calda (doccia, cucina, ecc.) generiamo anche un risparmio energetico.

Facilità di attuazione

Molto semplice. Il tipo di filetto interno o esterno deve essere verificato sul rubinetto installato. Nel caso di bollitori ACS, il riduttore di portata deve essere in grado di garantire una portata d'acqua minima per il suo corretto funzionamento.

Ammortamento

L'investimento si recupera in pochi mesi perché questi meccanismi sono economici.

Rispetto ambientale

L'acqua risparmiata è una risorsa naturale preservata. Inoltre, l'acqua risparmiata non deve essere resa potabile, distribuita o depurata e, quindi, gli impatti associati a questi processi sono ridotti. I materiali utilizzati sono di lunga durata.

Il mantenimento di una temperatura interna confortevole all'interno degli edifici, senza dover ricorrere all'uso diretto di energia, rappresenta l'obiettivo principale nel ridurre la domanda energetica di un edificio.

Questo obiettivo si concentra principalmente sull'ottimizzazione dell'involucro dell'edificio affinché possa sfruttare l'energia solare durante l'inverno e proteggersi dall'eccessivo surriscaldamento estivo, garantendo così condizioni interne salubri e confortevoli.

Considerando le modalità d'uso dell'edificio, le abitudini degli utenti e il relativo consumo energetico, emerge il concetto di gestione della domanda energetica. Le strategie combinate di riduzione e gestione della domanda costituiscono le misure passive proposte in questa guida. Tali strategie devono essere integrate fin dall'inizio del processo di riabilitazione dell'edificio e mantenute per tutta la sua vita utile, con il costante supporto tecnico di architetti o tecnici edili specializzati.

Le condizioni preesistenti dell'edificio determinano le strategie da adottare e, di conseguenza, le misure da implementare. Tra queste, l'orientamento dell'edificio riveste un ruolo cruciale: le parti dell'edificio orientate a Sud-Est, Sud e Sud-Ovest beneficiano della radiazione solare diretta durante l'inverno, a patto che non siano oscurate da altri elementi circostanti.

Oltre all'orientamento, altri fattori da considerare includono l'isolamento termico, la ventilazione naturale, l'uso di materiali a basso impatto ambientale e l'ottimizzazione dell'illuminazione naturale. Inoltre, la progettazione di spazi aperti come giardini e cortili interni può favorire il raffreddamento passivo dell'edificio durante i periodi estivi.

In sintesi, una corretta gestione della domanda energetica mediante misure passive rappresenta un approccio fondamentale per garantire la sostenibilità e l'efficienza energetica degli edifici, contribuendo così alla creazione di ambienti interni confortevoli e salubri per gli occupanti.

Tetti verdi

Progettati per reintrodurre l'elemento naturale nell'ambiente urbano, forniscono anche soluzioni a problemi come la gestione dell'acqua piovana e il cosiddetto effetto isola di calore urbano. Dal supporto strutturale, sono generalmente costituiti da telo impermeabilizzante, membrana antiradice, strato drenante, substrato e specie vegetali. E' necessario aggiungere un impianto di irrigazione e drenaggio della pioggia (dipenderà se il tetto è di tipo estensivo o intensivo).

Salute

Aria più pulita, grazie all'assorbimento di CO2 dall'ambiente, particelle di polvere e sostanze inquinanti nell'atmosfera. Agiscono come biofiltri di inquinanti. Anche il rumore in casa è ridotto.

Comfort

Miglioramento delle condizioni di comfort interno poiché il salto termico tra l'interno e l'esterno dell'edificio sarà minore a causa della sua elevata inerzia termica. Offrono anche un buon isolamento acustico poiché le piante, lo strato di terreno e l'aria all'interno agiscono come un cuscino che assorbe o devia le onde sonore. I miglioramenti termici e acustici dipendono dal grado di isolamento del tetto prima e dopo l'intervento.

Risparmio energetico o risparmio idrico

Porta ad una riduzione del fabbisogno energetico estivo ed invernale, in quanto gli impianti regolano la temperatura superficiale del tetto (la riduzione dipende dal grado di isolamento prima e dopo la misura). La terra fornisce inerzia termica e funge da strato isolante.

Facilità di attuazione

In primo luogo, deve essere effettuato uno studio dei carichi ammissibili. Successivamente è necessario spazzare la superficie e verificare che il telo impermeabilizzante sia in buone condizioni per posizionare il telo antiradice, il drenaggio, l'impianto di irrigazione, il substrato e le specie vegetali. È necessario un progetto e una manutenzione periodica.

Ammortamento

Aiuta anche a proteggere la membrana impermeabilizzante. Completato con un'ulteriore soluzione di isolamento termico esterno, migliora significativamente le prestazioni termiche del tetto.

Rispetto ambientale

Si consiglia di scegliere specie locali, terreno, substrato, sistemi di irrigazione e drenaggio di produzione nazionale per massimizzare l'impatto positivo sull'ambiente. Tuttavia, richiede una certa quantità di acqua.

isolamento della copertura

Incorporare l'isolamento termico sul tetto, all'esterno, al fine di mantenere la temperatura per ottenere il comfort all'interno dell'edificio. Ricordiamo che il tetto è l'involucro dove si perde più energia per m2 ed è anche il più esposto alla radiazione solare. Con l'aggiunta dell'isolamento termico, in inverno, si riducono le dispersioni termiche per conduzione e irraggiamento, mentre in estate diminuisce la richiesta di raffrescamento. Si consiglia di applicare uno spessore di isolante da 16 cm.

Salute

Il tetto coibentato offre qualità termica e acustica per l'utente dell'edificio, principalmente negli spazi sottostanti. Di solito vengono utilizzati pannelli XPS rigidi, ma se si dà la priorità ai materiali a basso impatto ambientale, si migliorerà indirettamente la qualità dell'aria, tra le altre cose.

Comfort

Miglioramento delle condizioni di comfort interno in quanto il salto termico tra interno ed esterno dell'edificio sarà minore per la presenza dell'isolamento termico.

Risparmio energetico o risparmio idrico

Il tetto è, dal punto di vista energetico, uno degli elementi più importanti, poiché il calore sale ed è il luogo dove si verificano le maggiori perdite in inverno. Inoltre, ha la funzione di conservare la temperatura per ottenere il comfort all'interno dell'edificio. È importante e consigliabile integrare questa misura con l'isolamento delle facciate e il rinnovo delle finestre.

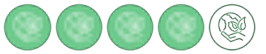
Facilità di attuazione

In genere è una soluzione poco complicata da implementare ed è anche veloce da implementare. Necessita di manutenzione periodica e di garantire l'impermeabilità del tetto all'acqua e all'aria.

Ammortamento

Il periodo di rimborso è lungo.

Rispetto ambientale



Risparmiare energia significa risparmiare emissioni di CO2 e l'isolamento prolunga la vita utile del tetto. A seconda del materiale utilizzato, si genererà un impatto maggiore o minore (i materiali di origine vegetale, come il sughero di produzione nazionale, sono a priori più rispettosi dell'ambiente rispetto a quelli di origine sintetica).

Isolamento esterno

Riduzione della richiesta di riscaldamento e raffrescamento dell'edificio migliorando il comportamento termico delle parti opache della facciata, mediante l'aggiunta di isolante termico finito con malta all'esterno. Possono essere installati pannelli di origine organica (sughero, fibre di legno), di origine minerale (lana di vetro o roccia) o di origine chimica (XPS ed EPS). Si consiglia di applicare uno spessore da 16 cm. Permette di sfruttare l'inerzia termica interna dell'involucro originale rendendo più stabile la temperatura interna.

Salute

Se si utilizza un isolante di origine organica o minerale, che sia traspirante, si elimina la condensa e la chiusura migliora il comportamento di fronte ai rumori esterni, aumentando la qualità acustica ambientale degli interni. Installando una rete di rame, è possibile eliminare le radiazioni dannose.

Comfort

Aumenta la sensazione di comfort all'interno perché vengono eliminati alcuni ponti termici: la differenza di temperatura tra le superfici delle pareti interne e l'aria interna riscaldata viene ridotta.

Risparmio energetico o risparmio idrico

In funzione delle caratteristiche costruttive originarie, se l'involucro originario è a camera e senza coibentazione, l'energia necessaria per la climatizzazione può essere ridotta di oltre il 30%.

Facilità di attuazione

Per portare avanti il progetto tecnico è necessario il consenso della comunità dei proprietari, che deve essere realizzato sull'intero edificio. È inoltre necessario ottenere una licenza dal Comune. Gli edifici elencati o protetti possono richiedere un progetto specifico o una soluzione su misura. Esistono sul mercato malte isolanti che possono essere integrate con altre misure di isolamento per l'interno.

Ammortamento

È una misura da considerare come un'opportunità al momento di effettuare qualsiasi intervento di manutenzione sulle facciate. L'ammortamento dipenderà dalle caratteristiche costruttive dello stato attuale e soprattutto dall'effettivo consumo energetico per il riscaldamento. E' necessario prevedere una parte della preparazione del paramento del supporto, quindi un costo aggiuntivo.

Rispetto ambientale

Si consiglia l'utilizzo di isolanti certificati, di origine biologica e di produzione nazionale. Per la produzione del polistirene espanso si utilizza quasi 30 volte l'energia necessaria per il sughero e si producono 70 volte più emissioni di CO_2. Durante la vita utile dell'edificio, le emissioni prodotte dal consumo di energia per la climatizzazione sono ridotte.

Isolamento interno

Riduzione della richiesta di riscaldamento e raffrescamento dell'edificio migliorando il comportamento termico delle parti opache dell'involucro, aumentando l'isolamento termico dell'interno mediante estradosso autoportante di cartongesso laminato o legno e riempiendo la camera con isolante termico. Possono essere lastre di lana minerale (di vetro o di roccia), polistirene espanso (EPS), sughero, lino, canapa, fibre di legno o coperte di lana di pecora o cotone e fiocchi di cotone o cellulosa con spessore minimo consigliato di 10 cm.

Salute

Se si utilizzano coibentanti di origine organica si possono eliminare le condense, quindi l'eccesso di umidità ed eventuali muffe. La qualità termica e acustica delle pareti viene migliorata, favorendo il benessere termico e acustico dell'utente.

Comfort

Aumenta la sensazione di comfort all'interno, perché c'è un rapido raggiungimento della temperatura di comfort dell'aria interna.

Risparmio energetico o risparmio idrico

L'energia dell'aria condizionata è ridotta dell'8-11%. Questo accorgimento non consente l'eliminazione di alcuni ponti termici importanti e quindi ha un potenziale di risparmio inferiore rispetto all'isolamento all'esterno.

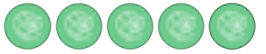
Facilità di attuazione

Sebbene non sia richiesto un progetto tecnico, si consiglia la consulenza di un architetto. Potrebbe essere necessario installare una barriera al vapore. Gli impianti esistenti dovranno essere adattati ai rivestimenti interni dell'involucro: prese, punti luce, riscaldamento, ecc. ma si possono fare senza regate, in quanto è un montaggio asciutto, veloce e pulito. La superficie interna utilizzabile si riduce di circa il 7%.

Ammortamento

L'ammortamento, a seconda delle caratteristiche termiche dell'involucro esistente, è compreso tra 20-30 anni.

Rispetto ambientale



Se l'isolante utilizzato è di origine vegetale e di produzione nazionale, l'impatto ambientale è minore. La riduzione delle emissioni di CO_2, dovuta alla riduzione del fabbisogno termico, migliora il rispetto ambientale.

Eliminazione dei ponti termici

I ponti termici sono punti nell'involucro architettonico attraverso i quali il calore indesiderato scorre molto più in alto rispetto al resto delle superfici. Sono prodotti rompendo l'involucro termico o attraverso discontinuità. I ponti termici si possono riscontrare su pilastri, solai, mensole, stipiti, architravi, sputacchiere, cassonetti, camini, fissaggi, ecc.

Salute

Aria più pulita e migliori condizioni di vita. La sua assenza previene la comparsa di condense, muffe, macchie di umidità, funghi e tossine che possono causare reazioni allergiche e problemi respiratori.

Comfort

Miglioramento delle condizioni di comfort termico interno, poiché viene eliminato l'effetto della bassa temperatura superficiale degli involucri delle facciate e, inoltre, la temperatura interna è più stabile.

Risparmio energetico o risparmio idrico

Porta ad una riduzione del fabbisogno energetico in inverno e in estate, poiché vengono eliminate le perdite o i guadagni energetici prodotti dalla trasmissione attraverso le coperture e la carpenteria.

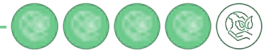
Facilità di attuazione

È necessario verificare l'esistenza di ponti termici attraverso uno studio termografico dell'involucro. Alcuni ponti termici sono relativamente facili da risolvere (ritorno dell'isolamento esterno attorno alle finestre) ma altri possono essere più complicati (balconi). In ogni caso, è necessario includere questa competenza durante la progettazione della ristrutturazione e la sua realizzazione.

Ammortamento

Variabile a seconda che si tratti di un problema di chiusura o di carpenteria. L'ammortamento è a lungo termine.

Rispetto ambientale



Si consiglia di utilizzare materiali naturali come sughero o fibre vegetali di produzione nazionale.

Riduzione delle infiltrazioni

Riduzione delle perdite di energia causate da perdite d'aria attraverso l'involucro (carpenteria, cassonetti, condotti di ventilazione, elementi incorporati nella facciata, ecc.) È importante rilevarli e realizzare una buona tenuta. Quando si pianifica una ristrutturazione profonda, è necessario includere soluzioni che garantiscano una buona tenuta, ad esempio avendo cura di incorporare il nastro sigillante in corrispondenza della giunzione della carpenteria con la facciata.

Salute

Il provvedimento permette di evitare che, in modo incontrollato, entri aria esterna che contiene sostanze inquinanti, provocando sbalzi di temperatura nello stesso locale e correnti d'aria interne in prossimità delle finestre. Tuttavia, il necessario rinnovo dell'aria deve essere garantito in modo controllato, poiché il solo provvedimento di sigillatura degli involucri potrebbe comportare un peggioramento della qualità dell'aria interna.

Comfort

Un buon controllo delle infiltrazioni indesiderate migliora il comfort acustico e il comfort termico, perché la sensazione di temperatura nello stesso ambiente è più uniforme e non si percepiscono correnti d'aria.

Risparmio energetico o risparmio idrico

Il risparmio energetico è di circa il 3%, applicando le soluzioni di tenuta più convenzionali. In una ristrutturazione approfondita, è consigliabile effettuare un test chiamato Blower door test per verificare che gli obiettivi di tenuta siano stati raggiunti.

Facilità di attuazione

Nella maggior parte dei casi l'applicazione del materiale sigillante è molto semplice, come nel caso dei nastri isolanti in gomma o PVC per la rivettatura in carpenteria o l'applicazione del nastro geotessile autoadesivo ai fori della facciata. Le dimensioni della carpenteria devono essere prese in considerazione. Tuttavia, nei progetti di ristrutturazione è necessario includere competenze, in quanto sono necessarie alcune soluzioni non tradizionali.

Ammortamento

Questa misura ha un periodo di rimborso compreso tra due e tre anni. È necessaria la manutenzione o la sostituzione del materiale sigillante, dei nastri adesivi, ecc.

Rispetto ambientale

La riduzione dei consumi energetici migliora il rispetto dell'ambiente riducendo le emissioni di CO_2.

Sostituzione dei vetri

Sostituire i vetri delle finestre esistenti con quelli con migliori prestazioni termiche, acustiche e luminose al fine di migliorare le condizioni di comfort interno della casa e ridurne il fabbisogno energetico. Gli occhiali devono soddisfare determinati requisiti minimi in risposta a diversi benefici. Si consiglia un vetro con una camera con una U (Trasmittanza termica) compresa tra 1,0 e 1,5 W/m2K e un basso fattore solare. Occorre analizzare, in funzione dell'orientamento, l'idoneità a collocare un vetro basso emissivo.

Salute

La chiusura diminuirà l'indice dei rumori esterni, migliorando la qualità ambientale acustica degli interni. È opportuno scegliere vetri con camera che non contenga SF6 (Esafluoruro di Zolfo).

Comfort

Un vetro di alta qualità migliora le condizioni di comfort interno a livello termico, in quanto vengono eliminate perdite o guadagni energetici indesiderati. Offrono anche un buon isolamento acustico fungendo da barriera che devia le onde sonore. Opportune vetrate filtrano il fastidioso riverbero del sole, lasciando entrare la luce naturale.

Risparmio energetico o risparmio idrico

L'uso di vetri adeguati può ridurre i guadagni solari in estate e le perdite di energia in inverno. Di conseguenza, si ha una riduzione del consumo energetico degli impianti di riscaldamento e raffrescamento. Si consiglia di integrare questa misura con la sostituzione degli infissi e con il miglioramento dell'isolamento della facciata e del tetto.

Facilità di attuazione

È necessario verificare l'esistenza di ponti termici attraverso uno studio termografico dell'involucro. Alcuni ponti termici sono relativamente facili da risolvere (ritorno dell'isolamento esterno attorno alle finestre) ma altri possono essere più complicati (balconi). In ogni caso, è necessario includere questa competenza durante la progettazione della ristrutturazione e la sua realizzazione.

Ammortamento

Il periodo di rimborso è lungo.

Rispetto ambientale

Si consiglia di scegliere un vetro con un alto contenuto di materiale riciclato e di produzione nazionale.

Sostituzione degli infissi

Sostituzione totale delle carpenterie esistenti con quelle con migliori prestazioni termiche che riducono notevolmente le dispersioni termiche attraverso di esse in inverno e guadagni indesiderati in estate. Se il telaio è in alluminio deve avere il taglio termico. Si consiglia di scegliere un valore di U (Trasmittanza termica) compreso tra 0,8 e 1,6 W/m2K (a seconda dei casi) per il totale della carpenteria (telaio+vetro) e permeabilità all'aria inferiore a 10m3/hm2 (alla pressione di 100Pa).

Salute

Per la carpenteria in legno è necessario sceglierli senza vernici o COV per favorire la qualità dell'aria. Per gli altri materiali, anche i COV dovrebbero essere ridotti al minimo, a parte gli aspetti di tossicità più legati alla produzione industriale.

Comfort

La carpenteria di alta qualità migliora le condizioni di comfort interno a livello termico. Riduce notevolmente le perdite o i guadagni energetici indesiderati dovuti alle infiltrazioni, in quanto offrono un elevato grado di tenuta. A questi miglioramenti si aggiungono quelli del vetro (scheda P07).

Risparmio energetico o risparmio idrico

Risparmio energetico
L'uso di falegnameria e vetrature adeguate può ridurre i guadagni solari in estate e le perdite di energia in inverno. Di conseguenza, si ha una riduzione del consumo energetico degli impianti di riscaldamento e raffrescamento. Si consiglia di integrare questa misura con la sostituzione del vetro e con un miglioramento dell'isolamento della facciata e del tetto.

Facilità di attuazione

Occorre dimensionare opportunamente i vuoti e scegliere opportunamente carpenterie e vetri a bassa trasmittanza termica, bassa permeabilità e rottura del ponte termico. In fase di posa è necessario ridurre l'effetto ponte termico del sistema finestra-parete. Richiede competenza nella progettazione e nell'installazione e richiede una manutenzione periodica.

Ammortamento

Il periodo di rimborso è lungo.

Rispetto ambientale

Si consiglia di scegliere legno certificato o alluminio di produzione nazionale, che generalmente ha un alto contenuto di materiale riciclato.

Schermature solari

L'uso di protezioni solari (sbalzi, veneziane, persiane, lamelle, pergolati, tende da sole, alberi decidui...) riduce la radiazione solare che raggiunge gli edifici. La radiazione solare è composta principalmente da raggi UV, infrarossi e luce visibile. Un buon controllo di questo riduce la temperatura interna e l'abbagliamento. Sono necessari in estate per evitare il surriscaldamento e devono essere incorporati sulle facciate sud, est e ovest.

Salute

L'abbagliamento è dannoso per i nostri occhi e i raggi UV per la pelle. In commercio esistono filtri solari con tessuti che bloccano i raggi UV tra il 90 e il 99% e riducono l'abbagliamento. Inoltre, impediscono il surriscaldamento.

Comfort

La possibilità di poter controllare l'abbagliamento e il surriscaldamento è importante anche per migliorare la percezione dello spazio, il comfort ambientale.

Risparmio energetico o risparmio idrico

Il fabbisogno energetico per il raffrescamento estivo può essere ridotto fino al 40%. Introducendo elementi ombreggianti utilizzabili dall'esterno, l'irraggiamento incidente viene ridotto in estate e, in inverno, viene lasciato penetrare per innalzare la temperatura interna. I sistemi automatici consentono di raggiungere livelli più elevati di efficienza energetica.

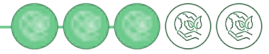
Facilità di attuazione

Ci sono due aspetti da considerare: quello tecnico e quello estetico. Il tecnico per l'eventuale alterazione di elementi costruttivi che possono generare problemi di perdite o sovrappeso. Estetica dovuta al rispetto delle normative del Paesaggio Urbano, o altre, come gli statuti delle associazioni di quartiere.

Ammortamento

Sarà correlato all'orientamento della casa e alla dimensione delle aperture. Il recupero dell'investimento è a lungo termine, anche se ci consente di ridurre o evitare l'installazione di aria condizionata.

Rispetto ambientale



Quando facciamo un uso corretto di questi elementi, la necessità di aria condizionata diminuisce in estate e la richiesta di riscaldamento diminuisce in inverno, con un impatto favorevole sull'ambiente. Si consiglia di scegliere prodotti di qualità e locali per ridurre l'impatto ambientale.

Muro di Trombe

È un elemento costruttivo dell'architettura passiva per ottenere apporti termici, ma che generalmente non può competere con una facciata ad alte prestazioni. Può presentare problemi di surriscaldamento, pulizia e costo elevato. È necessario studiarne bene il design per garantirne il corretto funzionamento. Costituito da: Strato interno ad elevata inerzia termica, di colore scuro sul lato esterno e con aperture praticabili in basso e in alto, Camera d'aria intermedia e Involucro in vetro trasparente a bassa trasmittanza termica e con aperture praticabili nella parte inferiore e superiore.

Salute

È una soluzione tecnica passiva. Processo utilizzato per ottenere il riscaldamento progressivo dell'aria contenuta nella camera d'aria, riscaldata per convezione naturale nell'ambiente abitativo adiacente. Fornisce un miglioramento del comfort termico.

Comfort

Miglioramento delle condizioni di comfort interno in inverno fornendo flusso di calore all'interno dell'abitazione. Questa soluzione potrebbe creare un problema di comfort in estate a causa del surriscaldamento, quindi deve incorporare una protezione solare ottimale ed essere ventilata. Le aperture inferiore e superiore sono utilizzate in estate per il free-cooling.

Risparmio energetico o risparmio idrico

In quanto sistema di captazione passiva, porta ad una riduzione del fabbisogno energetico nel periodo invernale, in quanto l'apporto di calore all'ambiente avviene senza la necessità di ricorrere al consumo di energia elettrica o di combustibili fossili. Senza una progettazione idonea, potrebbe generare sovraconsumi in raffrescamento.

Facilità di attuazione

È un sistema passivo che deve essere orientato verso il sole. Lo strato interno è costruito con materiali come pietra, cemento o mattoni, lo strato intermedio è una camera d'aria e lo strato esterno con una semplice lastra di vetro. È più adatto per luoghi con aria pulita e si dovrebbe sempre prevedere la pulizia periodica dell'impianto. Richiede bassi investimenti ma ha bisogno di manutenzione, monitoraggio e controllo del suo funzionamento per essere efficace.

Ammortamento

Il costo può variare, a seconda della finitura e dei materiali utilizzati per la realizzazione dei due strati. L'ammortamento è a lungo termine.

Rispetto ambientale

È consigliabile che i materiali che lo compongono siano di produzione nazionale.

Ventilazione naturale

La ventilazione naturale è il risultato di una differenza di pressione tra le diverse facciate di un edificio dovuta al vento o a una differenza di temperatura. Favorisce lo scambio con l'ambiente e il rinnovo dell'aria viziata interna, e facilita il naturale processo di raffreddamento per evaporazione. Previene la comparsa di muffe. Auspicabile in edifici con bassa inerzia termica in quanto la temperatura dei rivestimenti viene scambiata più rapidamente con l'aria interna rinnovata. Non sempre garantisce la qualità dell'aria interna e può portare ad un aumento del consumo energetico.

Salute

L'aria che respiriamo in uno spazio chiuso può concentrare inquinanti provenienti dalle attività che svolgiamo, dai prodotti che utilizziamo e dai materiali da costruzione. L'eccesso di umidità interna, superiore al 60%, produce una sensazione di disagio e la formazione di condensa e muffe che possono provocare reazioni allergiche e irritazioni. La ventilazione incrociata rinnova l'aria ma può contenere inquinanti provenienti dall'esterno, ad esempio quelli del traffico stradale.

Comfort

L'aumento della velocità dell'aria interna facilita l'evaporazione dell'umidità dalla superficie della pelle. Il rinnovo dell'aria viziata e l'eliminazione degli odori aumentano la sensazione di comfort. È necessario evitare correnti d'aria e la comparsa di rumori e odori provenienti dall'ambiente (vicinato, stabilimenti, traffico, industria), aprendo in funzione delle condizioni esterne.

Risparmio energetico o risparmio idrico

Se la ventilazione è effettuata nelle giuste condizioni, si ottiene il free cooling in estate ventilando di notte se, durante il giorno, si evita anche l'ingresso di aria calda e l'irraggiamento esterno. Nel frattempo è il momento più interessante per andarci.

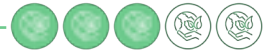
Facilità di attuazione

Richiede che vi siano finestre aperte sull'esterno o su un cortile, su pareti opposte o su pareti perpendicolari. L'utente è colui che deve aprire le finestre una di fronte all'altra per il tempo necessario, sfruttando le naturali correnti d'aria e facendo in modo che ciò avvenga dai locali asciutti a quelli umidi. Le aperture attraverso le quali entra l'aria fresca devono essere più grandi di quelle attraverso le quali avviene l'uscita. Si consigliano 30 m^3/h per persona.

Ammortamento

Questa misura dipende dall'utente, in realtà non ha un costo associato, sebbene il consumo di energia possa essere generato per riscaldare (e raffreddare se necessario) l'aria rinnovata. In inverno bisogna sfruttare le ore di irraggiamento solare e aprire per circa 2 minuti ogni ora mentre c'è occupazione per evitare perdite.

Rispetto ambientale



È molto difficile garantire aria pulita e basse dispersioni energetiche, solo riducendo la richiesta di raffrescamento si riducono le emissioni di CO_2 associate.

Riduzione del fabbisogno di raffrescamento dell'edificio (o miglioramento del comfort, in assenza di impianti di raffrescamento) mediante l'applicazione di rivestimenti ad alta riflettività. Coperture e facciate possono essere rivestite con vernici o altri materiali (metallo, tegole o altro) che abbiano caratteristiche certificate di elevata riflettività solare ed elevati valori di emissività infrarossa, rispetto ai prodotti convenzionali. Un elenco di prodotti è disponibile sul sito web dell'European Cool Roofs Council.

Salute

Questa misura fornisce un notevole miglioramento del comfort termico in estate. Riduce inoltre il fenomeno dell'isola termica nelle immediate vicinanze dell'edificio.

Comfort

Il comfort estivo aumenta, a causa dell'abbassamento della temperatura del tetto e delle facciate dove è stato applicato il rivestimento. Tuttavia, più la copertura è isolata termicamente, meno questo effetto sarà evidente.

Risparmio energetico o risparmio idrico

La richiesta di raffreddamento è ridotta. A seconda del grado di isolamento del tetto e della facciata e del fattore di forma dell'edificio, si otterranno diversi risparmi. È una delle poche misure di raffreddamento passivo, che deve essere integrata con altre.

Facilità di attuazione

Non c'è bisogno di un progetto tecnico o di una licenza del Comune, ma serve un tecnico specializzato per selezionare il prodotto giusto e poterne valutare l'utilità. I guadagni termici diminuiscono in inverno e possono essere compensati aggiungendo isolamento termico.

Ammortamento

Se si dispone di apparecchiature di refrigerazione, il ritorno sull'investimento viene generalmente realizzato in meno di 5 anni. Inoltre, il provvedimento allunga anche la durata della copertura.

Rispetto ambientale

Il consumo di energia e quindi le emissioni di CO_2 sono ridotti.

Ottimizzazione dell'illuminazione

Poiché il dispositivo di consumo più efficiente è quello che spegniamo, dobbiamo ridurre il tempo di accensione delle fonti di luce artificiale. A tale scopo, la migliore tecnologia esistente è il LED SLT, sfruttando il fatto che è il migliore per essere regolato, temporizzato o rilevato automaticamente dalla presenza, dalla prossimità o dalla cattura della luce naturale.

Salute

La lampadina spenta o regolata a potenza minore è quella che consuma meno e inquina il nostro habitat. La cosa più salutare è sfruttare la luce solare naturale, ma quando non può esserlo, la luce artificiale minima necessaria.

Comfort

L'occhio umano è più adatto alla luce solare e i suoi cicli regolano il nostro orologio interno. Con la regolazione si può migliorare il comfort visivo, adattando la quantità di luce al piacere degli utenti, con identica efficienza.

Risparmio energetico o risparmio idrico

Regolando l'intensità o il tempo di utilizzo si risparmia la maggior quantità di energia elettrica. Può essere la soluzione più efficace di tutte in esempi come i precedenti, dove la reale necessità di illuminazione è ridotta.

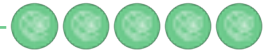
Facilità di attuazione

Attualmente esiste una grande diversità di tecnologie che consentono la regolazione dei corpi illuminanti, come sensori di presenza o prossimità, fotosensori, temporizzatori o anche sistemi di controllo automatico con regolatori.

Ammortamento

Unendo le schede precedenti e riducendo i tempi di utilizzo e regolazione, l'ammortamento può diventare inferiore al semestre. Ad esempio, nei bagni pubblici, nei parcheggi, nelle scale, nei magazzini o nei corridoi, è tipico sostituire le lampadine termiche. Riducendo i tempi di accensione e regolazione si ottiene un risparmio di circa il 97%.

Rispetto ambientale



Grazie alla riduzione delle ore di consumo e all'allungamento della durata delle lampade, l'impatto ambientale è minore. Rilavorazioni ridotte creano meno sprechi producendo fino a 20 volte meno.

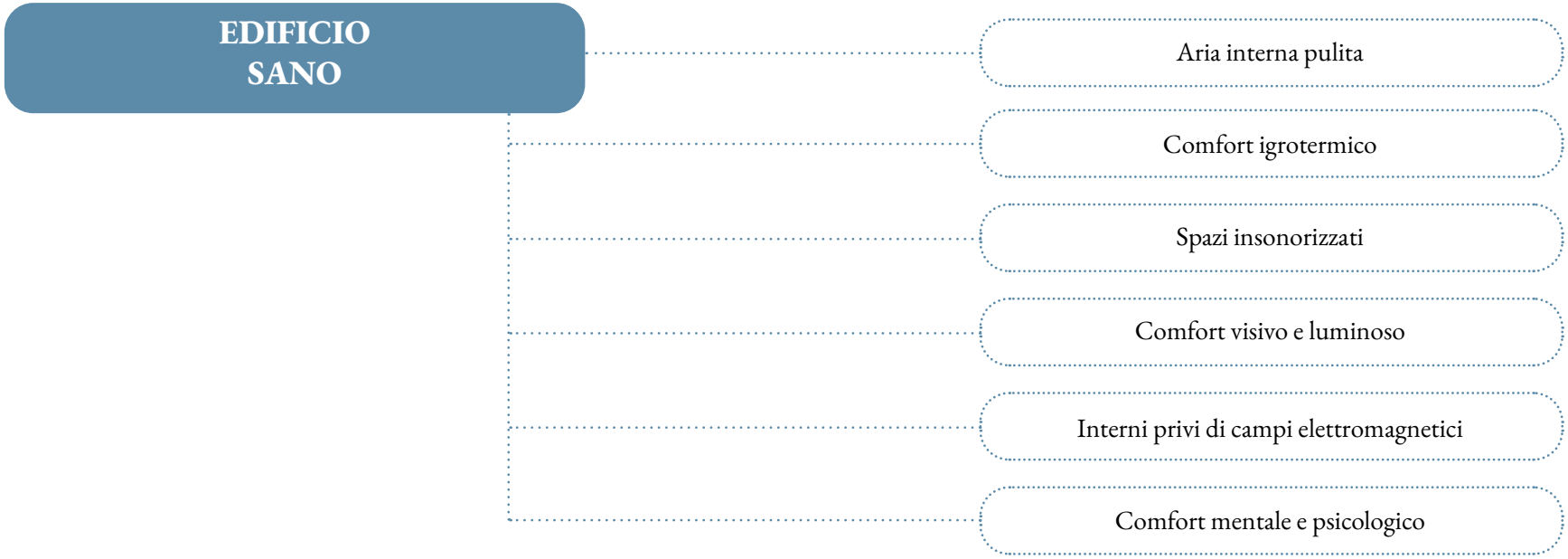
La qualità ambientale all'interno degli edifici è influenzata da una serie di fattori che sono stati tradotti in indicatori misurabili nel tempo attraverso normative e standard.

Attualmente, le evidenze scientifiche riguardanti i rischi per la salute associati a ambienti interni di scarsa qualità hanno portato a definire standard più rigorosi per i parametri che influenzano la salute e il comfort degli utenti.

Nonostante le conoscenze già acquisite, le condizioni interne degli edifici, sia nuovi che esistenti, possono essere significativamente migliorate mediante cambiamenti nelle abitudini e negli utilizzi, nonché l'adozione di prodotti e tecnologie già disponibili sul mercato. È importante considerare che l'avanzamento della tecnologia e del design architettonico contribuisce a risolvere problemi noti, come l'ottimizzazione dell'illuminazione naturale o il ricambio dell'aria, ma allo stesso tempo possono emergere nuove sfide, come ad esempio il problema dell'elettricità statica, riconosciuta come una delle cause della lipoatrofia. Pertanto, la scienza che studia la salute e il comfort all'interno degli edifici è in costante evoluzione, rivelando sia nuovi problemi che nuove strategie per affrontarli.

Un altro aspetto determinante è rappresentato dagli utenti stessi, poiché ognuno di noi reagisce in modo diverso agli stimoli ambientali. Pertanto, un ambiente salubre deve garantire un'aria interna pulita, un ambiente privo di rumore e una buona illuminazione naturale, oltre a una progettazione dell'illuminazione artificiale efficace ed efficiente. È essenziale anche assicurare un adeguato comfort termico e limitare la presenza di campi elettromagnetici nei punti in cui gli utenti trascorrono il loro tempo all'interno dell'edificio.

In sintesi, migliorare la qualità ambientale indoor richiede un approccio olistico che consideri una varietà di fattori, comprese le normative vigenti, le tecnologie disponibili, le esigenze degli utenti e le più recenti scoperte scientifiche nel campo della salute e del benessere nell'ambiente costruito.



Temperatura e umidità ottimali

La temperatura e l'umidità di comfort dipendono da diversi fattori quali il clima esterno, i sistemi ei materiali costruttivi e la tipologia degli occupanti, nonché l'attività che questi svolgono. Tali parametri, inoltre, dipendono anche da altri fattori quali l'ubicazione e le caratteristiche costruttive dell'edificio, l'impianto di climatizzazione esistente e gli apporti termici dovuti a fonti interne.

Strategie

In inverno, la temperatura di comfort viene raggiunta quando l'aria interna è temperata all'intervallo appropriato e non ci sono correnti d'aria indesiderate. L'energia solare incidente attraverso le finestre e le portefinestre o il calore fornito dall'impianto di riscaldamento contribuiranno a raggiungere la temperatura adeguata. È inoltre necessario che le superfici non siano fredde, vale a dire che la temperatura di pareti, vetri, pavimenti e soffitti sia vicina a quella dell'aria per evitare quella sensazione di freddo o caldo quando ci avviciniamo. Ciò si ottiene con buste ben isolate.
In estate, misure passive come la protezione solare, il controllo del calore generato all'interno, la ventilazione notturna, il raffreddamento di tetti e facciate, ecc., aiutano a mantenere una temperatura interna confortevole. Tuttavia, a volte può essere necessario un raffrescamento attivo (pompa di calore o soffitto radiante, ad esempio).
Il condizionamento radiante (a temperatura prossima al comfort) è quello che offre il maggior comfort termico.
Oltre alla temperatura, anche l'umidità relativa dell'ambiente determinerà la sensazione di caldo o freddo. Un'adeguata umidità relativa viene mantenuta grazie ad un edificio che non presenta umidità, con un'adeguata ventilazione e un buon controllo della generazione di vapore interno. I materiali igroscopici possono aiutare a regolare l'umidità ambientale. In climi piuttosto umidi può essere opportuno installare un deumidificatore, generalmente abbinato al sistema di ventilazione.
Le condizioni di comfort termico interno sono influenzate anche dalla velocità dell'aria, che è controllata attraverso il sistema di ventilazione, ma nel caso della ventilazione naturale l'utente ha una sfida da risolvere.
I sistemi di ventilazione meccanica con recupero di calore consentono di evitare l'ingresso di aria fredda o calda all'interno dell'edificio, nonché di regolare l'umidità dell'aria, quindi rappresentano una strategia con grandi potenzialità per il comfort dell'utente.

Opportunità

Quando viene riabilitato, è necessario puntare su chiusure e coibentazioni che garantiscano un elevato grado di isolamento termico per evitare la condensa, oltre a trattare i ponti termici ove possibile. È inoltre necessario prevedere il rinnovo dell'aria in modo che offra condizioni confortevoli, indipendentemente dal tempo esterno. Inoltre, l'impianto di riscaldamento e raffrescamento dovrebbe essere gestito con termostati basati sulla temperatura interna.

Difficoltà

Quando non è possibile garantire buone prestazioni di isolamento termico dell'involucro con materiali che non regolano l'umidità.

Ventilazione e ricambio d'aria

Per ottenere un'aria interna sufficientemente pulita, è necessario considerare diverse strategie di rinnovo dell'aria. Questi hanno un impatto sia sul consumo energetico che sul comfort. La ventilazione naturale non garantisce sempre aria pulita e, negli ambienti urbani, incorpora inquinanti esterni. La ventilazione meccanica offre invece elevate prestazioni di recupero del calore e di filtrazione di alcuni inquinanti, ma richiede un certo ingombro e un'attenta progettazione e realizzazione.

Strategie

Un edificio sano ha bisogno di rinnovare continuamente l'aria, soprattutto mentre ci sono utenti.
Una strategia a disposizione di tutti gli utenti è quella di aprire le finestre e favorire la ventilazione incrociata. (Vedi foglio P12). Ma questo non sempre è efficace, vuoi perché la disposizione delle aperture nell'edificio non ne consente l'attraversamento, vuoi perché le condizioni di temperatura e di vento non favoriscono la circolazione dell'aria, vuoi perché l'inquinamento dell'aria esterna è elevato
A parte questo, va notato che la ventilazione naturale non consente un basso consumo energetico durante tutto l'anno, a causa della differenza di temperatura tra l'aria esterna e quella interna.
La ventilazione notturna naturale è una strategia efficace e interessante per migliorare il comfort estivo; tuttavia, è più difficile controllare l'inquinamento proveniente dall'esterno (aria e rumore) e deve essere garantita la sicurezza.
La ventilazione meccanica garantisce sempre i necessari ricambi d'aria, e con l'utilizzo di opportuni filtri l'inquinamento dall'esterno può essere notevolmente ridotto (vedi scheda A11). Ciò richiede, tuttavia, l'installazione preventiva da parte di un tecnico competente.
La ventilazione igroregolabile può offrire una buona alternativa in alcuni climi temperati, ma è meno efficiente dal punto di vista energetico e impedisce l'ingresso di inquinanti esterni.

Opportunità

I problemi di odore, diffusi soprattutto nei cortili interni degli edifici plurifamiliari, possono essere l'occasione per affrontare soluzioni legate al rinnovo dell'aria che implicano soluzioni tecniche e anche cambiamenti nelle abitudini della comunità di quartiere. In ogni caso, un rinnovo energetico deve sempre prevedere soluzioni di rinnovo dell'aria per prevenire problemi di salute e benessere.

Difficoltà

La ventilazione naturale presenta difficoltà quando si tratta di inserire filtri (sarebbe necessario forzare il movimento dell'aria con un ventilatore) ed è necessario impedire l'ingresso di animali ed eventuali atti di vandalismo.
La ventilazione meccanica richiede un'attenta progettazione e installazione per garantire un buon rinnovo ed evitare problemi di rumore, inoltre comporta un piccolo consumo elettrico. Deve essere ben mantenuto, sostituendo i filtri quando opportuno, e progettato con materiali che non generano cariche elettrostatiche.

Materiali da costruzione

I prodotti da costruzione come isolanti, parquet, falegnameria, rivestimenti, vernici, controsoffitti e altri influiscono sulla qualità dell'aria. Questi prodotti sono realizzati con materiali che possono quindi emettere gas e particelle nell'ambiente interno. I professionisti e gli utenti possono selezionare materiali che emettono quantità inferiori nell'ambiente o che sono fabbricati con sostanze non tossiche.

Strategie

Nella fabbricazione di molti prodotti da costruzione vengono utilizzate alcune sostanze pericolose per la salute delle persone. Gli utenti di un edificio entrano in contatto con questi prodotti durante la loro vita utile. Gli inquinanti sono composti organici volatili (COV), composti organici persistenti, particolato, amianto, piombo e allergeni. Uno dei contaminanti più comuni nei materiali da costruzione è la formaldeide, un composto organico volatile irritante e cancerogeno che può persistere per mesi e anni.
Si consiglia di privilegiare l'uso di materiali di origine e composizione naturale e con un certificato di basse emissioni di inquinanti dell'aria interna.

Opportunità

Si consiglia di richiedere le schede tecniche e di sicurezza dei materiali per conoscerne la composizione e l'eventuale tossicità. In alcuni casi, l'uso di sigilli normativi ci aiuterà a convalidare che i prodotti utilizzati soddisfano realmente i criteri richiesti. Esistono diversi sigilli che certificano l'uso di materiali naturali e in cui la concentrazione di composti tossici è limitata (Ecolabel, Aenor tipo I Ecolabel), e altri che certificano le emissioni generate nell'aria interna (etichetta francese sulle emissioni VOC dell'aria interna).

Difficoltà

Sebbene il mercato offra sempre più materiali naturali, è ancora lontano dal raggiungere che il 100% dei prodotti da costruzione sia naturale. Non esistendo un'etichetta nazionale dedicata alla rendicontazione delle emissioni in aria indoor, si consiglia di richiedere le schede tecniche e confrontare la composizione con, ad esempio, l'elenco "Risctox de Istas" o cercare etichette di altri paesi.

Le abitudini di uso e manutenzione si riferiscono più specificamente a tutto ciò che riguarda l'igiene e la disinfezione dello spazio interno. I prodotti che solitamente vengono utilizzati per la pulizia e la disinfezione contengono sostanze tossiche che possono nuocere gravemente alla salute di persone, animali e piante.

Strategie

La pulizia degli spazi interni va fatta privilegiando soluzioni a base di acqua o vapore e i prodotti più naturali, con etichette ecologiche o utilizzando formule vegetali e casalinghe (a base di ingredienti come aceto, limone, bicarbonato o sapone). È importante controllare le dosi di prodotto da utilizzare, assicurandosi sempre che questa sia la minima possibile. E non applicare i prodotti accanto a bambini, nonni, donne incinte o persone particolarmente sensibili a questo tipo di prodotto. È essenziale garantire una buona ventilazione durante l'applicazione e anche per un certo periodo dopo l'azione di pulizia.
La pulizia è fondamentale anche per evitare l'accumulo di agenti inquinanti all'interno, come pollini o particelle di polvere. È importante rimuovere regolarmente la polvere (con panni umidi) e aspirare (con filtri ad alta capacità di filtrazione: HEPA H13 o H14, EPA E12, ULPA, che devono essere cambiati ogni 6-12 mesi). L'uso delle scope è sconsigliato, ma in ogni caso bisogna fare molta attenzione ad alzare la minima quantità di polvere.
È importante che la disinfezione in caso di parassiti o simili venga eseguita da un professionista, per quanto possibile. Sarà inoltre importante rispettare le dosi indicate dal produttore del prodotto da utilizzare.

Opportunità

L'igiene e la disinfezione sono già un'abitudine degli utenti, ma incorporando alcuni suggerimenti specifici è possibile migliorare notevolmente la qualità dell'aria.

Difficoltà

Il mercato tende a mettere a disposizione del pubblico tutta una serie di prodotti che vengono venduti con la promessa della massima e duratura igiene, ma la realtà è che molti contengono eccessive sostanze tossiche che possono finire per incidere gravemente sulla salute di chi ne fa uso usarli regolarmente.

Isolamento acustico e vibrazioni

Il rumore generato all'interno della casa, nell'ambiente limitrofo e nell'ambiente circostante può essere fastidioso e portare ad alterazioni della salute, così come le vibrazioni trasmesse attraverso la struttura e l'involucro edilizio.
All'interno della casa possiamo proteggerci intervenendo sulle fonti emittenti, migliorando le abitudini e proteggendoci dalle fonti esterne.

Strategie

Il rumore ha diversi effetti sulla salute a seconda della sua durata e intensità. Per isolarsi dai rumori provenienti dall'esterno, una buona soluzione è un buon isolamento acustico (i prodotti per questo scopo hanno solitamente anche proprietà di isolamento termico) nell'involucro (P03 e P04) e nelle finestre a tenuta stagna (P08) con doppi vetri (P07). Le infiltrazioni indesiderate che possono esistere nell'edificio costituiranno un gradino per il rumore verso l'interno (P06).
Per eliminare l'effetto dovuto al rumore interno, il più consigliato è eliminare o ridurre l'intensità della sorgente. A volte è necessario essere consapevoli in anticipo delle fonti che emettono rumore.
Le vibrazioni all'interno di un edificio possono essere trasmesse attraverso la struttura o l'involucro e sono generalmente causate da vari tipi di macchinari. Per prima cosa è necessario individuare la fonte della vibrazione per poter applicare le soluzioni più opportune al riguardo. È importante evitare che le vibrazioni si trasmettano attraverso i materiali a contatto con la sorgente, per questo attorno ad essa si possono posizionare degli isolamenti, oppure appositi sistemi di smorzamento che bloccano il passaggio delle vibrazioni.
L'involucro a contatto con la sorgente di vibrazione può essere isolato o coibentato.

Opportunità

È importante essere rispettosi e tenere presente che la riduzione del rumore all'interno e all'esterno delle città è una responsabilità condivisa da tutti noi. Il rumore che generiamo con la nostra attività (guidare, parlare, giocare, ascoltare musica, ecc.) può causare disagio al resto dei nostri concittadini. In alcuni casi, rivolgersi a un mediatore può aiutare a risolvere problemi, tra cui il rumore.

Difficoltà

Risolvere problemi di rumore e vibrazioni è complesso e in molti casi sarà necessario l'aiuto di un esperto del settore che possa fare un'analisi globale del problema per trovare la soluzione più adatta.

Condizionamento acustico

Il comportamento del suono in un ambiente chiuso è diverso da quello che la stessa sorgente emetterebbe all'esterno. A volte la disposizione degli elementi all'interno di una stanza o la sua morfologia pregiudicano la chiarezza della trasmissione del suono, rendendo difficile la comprensione delle parole o la percezione musicale. L'obiettivo del condizionamento acustico è modificare la risposta del suono in uno spazio per migliorarne la qualità.

Strategie

Il comportamento del suono in un ambiente chiuso è determinato dalle molteplici riflessioni che si verificano tra il suono e le pareti, il soffitto e il pavimento della stanza, e costituiscono la risposta acustica. Il parametro fondamentale che determina in gran parte la qualità acustica di una stanza è il tempo di riverbero. Il tempo di riverbero dipende da quanto sono assorbenti le superfici dello spazio.
Esistono diversi materiali assorbenti sul mercato per diverse applicazioni. Sono classificati in base al tipo di materiale e al suo meccanismo di assorbimento: assorbitori per porosità, per cavità o per membrana. D'altra parte, anche i tessuti, i mobili e le persone nella stanza fungono da fonoassorbenti.
Se ci sono troppe superfici assorbenti in uno spazio interno e il suono non viene riflesso, viene praticamente attutito e non raggiunge il resto delle persone. Al contrario, se non ci sono quasi superfici assorbenti, il suono viene eccessivamente riflesso e raggiunge i ricevitori ma è intelligibile. Pertanto, è importante trovare la via di mezzo e aggiungere o rimuovere gli assorbitori a seconda dei casi.

Opportunità

Migliorare l'acustica di uno spazio porta comfort e benessere agli utenti.

Difficoltà

Il condizionamento acustico di ambienti dove è particolarmente importante per il loro utilizzo che il suono arrivi con la massima qualità (come sale riunioni, teatri, auditorium, ecc.) è consigliato da un tecnico esperto del settore.

La luce naturale è importante perché ci porta molti benefici sia a livello fisiologico che mentale. Quando le persone non sono esposte a luce naturale sufficiente durante il giorno, i loro ritmi circadiani sono alterati e questo porta a disturbi del sonno e depressione. Una buona esposizione alla luce naturale durante l'orario di lavoro influenza il nostro benessere, la produttività e la capacità di apprendimento e ritenzione.

Strategie

Numerosi sono gli interventi possibili per massimizzare il contributo della luce naturale. Esistono interventi più semplici che comportano il cambio delle tende con altre più traslucide, la tinteggiatura delle stanze con colori chiari o la pulizia delle finestre.
E ci sono anche interventi più complessi che prevedono la realizzazione di opere o l'intervento di un tecnico competente, come l'ingrandimento delle finestre, il cambio del tipo di vetro con uno più trasparente, l'apertura di lucernari in copertura, l'installazione · fare luce pozzi, inserire partizioni traslucide o sistemi di copertura con specchi per reindirizzare la luce naturale all'interno.
Quando si massimizza il contributo della luce naturale è importante anche evitare l'abbagliamento, così come i riflessi sugli schermi di computer e televisori. La scelta delle tende e delle protezioni solari per gestire l'apporto di luce è importante. In commercio esistono molteplici soluzioni che rendono diffusa la luce in ingresso, in modo da sfruttare l'apporto della luce naturale, evitando i problemi che può causare quando è diretta.
Oltre alla selezione e installazione dei prodotti, l'utente dovrà gestire correttamente i dispositivi.

Opportunità

Una buona esposizione alla luce naturale influenza il nostro benessere, la produttività e la capacità di apprendere e conservare.

Difficoltà

In estate è necessario evitare il surriscaldamento e le soluzioni potrebbero essere incompatibili con la garanzia di una buona illuminazione naturale. Devi stare attento quando trovi compromessi in questo senso.

La luce più sana è sempre quella naturale, ma a volte non è possibile averla ed è in questi casi che è importante una buona progettazione e l'uso della luce artificiale. Le strategie di illuminazione artificiale dovrebbero simulare la luce naturale, nei suoi cicli e intensità, per quanto possibile, per ridurre al minimo l'alterazione dei bioritmi e massimizzare il contributo di una buona illuminazione.

Strategie

Una buona illuminazione artificiale deve mantenere l'uniformità spaziale e temporale, con la luce diretta dove serve e allo stesso tempo limitando l'abbagliamento.
le lampade La scelta delle lampade giuste è un fattore chiave, dove le principali caratteristiche da considerare sono:
– Temperatura di colore: la luce bianco-blu ci sveglia e stimola l'attività fisica e mentale, a differenza della luce
più caldo e più rosso ci rilassa attivando le aree del cervello che ci preparano al sonno.
- Riproduzione del colore (CRI): Si consigliano quelle lampade che riproducono al massimo lo spettro solare, sopra 80, cioè con un CRI >= 80.
– Intensità luminosa (lux): deve essere adeguata all'attività da svolgere. Per le attività che richiedono attenzione (cucito, bricolage, disegno...) si consiglia di avere almeno 1000 lux, mentre per cucinare, ad esempio, sarebbero sufficienti 500 lux. Si consiglia inoltre di abbassare il più possibile l'intensità prima di andare a dormire.
– Sfarfallio: è importante assicurarsi che le luci abbiano il minimo sfarfallio possibile. Le luci a incandescenza o alcune luci a LED di bassa qualità, ad esempio, producono molto sfarfallio.
– Radiazioni elettromagnetiche: allo stesso modo, è necessario cercare luci con la minor quantità di radiazioni elettromagnetiche.

Opportunità

Una buona progettazione dell'illuminazione artificiale di uno spazio può migliorare la salute, le prestazioni lavorative e il benessere delle persone.

Difficoltà

La cosa più importante nella scelta di una lampada (sorgente luminosa) è scegliere la massima classe energetica, e assicurarsi che abbia la certificazione Ecolabel.
– Lampade a basso consumo (CFL): aiutano a risparmiare energia ma allo stesso tempo sono lampade che contengono sostanze tossiche. È importante ricordare che contengono mercurio, quindi devi fare molta attenzione se sono rotti e seguire rigorosamente le raccomandazioni sanitarie. Queste lampade sono una fonte di luce UV che può essere dannosa a breve distanza e presenta anche sfarfallio.
– Lampade a LED: hanno anche un bassissimo consumo energetico e non hanno i gradi di tossicità delle CFL. Esistono molti tipi di lampade a LED e la qualità che si può trovare sul mercato è molto variabile. Tuttavia, è importante sottolineare che la grande maggioranza dei LED emette una porzione di luce blu e questo può causare disturbi del sonno. I valori ICR da 85 sono i più sani. Quasi tutti i LED sfarfalleranno dopo 1 anno e i LED di qualità inferiore emetteranno più radiazioni elettromagnetiche.
– Lampade alogene: dal punto di vista dell'efficienza energetica è la tecnologia meno efficiente tra quelle presentate. Tuttavia, le lampade alogene hanno un ICR elevato, ma sfarfallano molto ed emettono radiazioni elettromagnetiche.

Un altro inquinante importante è l'elettricità statica, che viene alterata principalmente dagli effetti atmosferici (umidità relativa molto bassa), ma anche dai campi elettromagnetici vicini e da altri fattori. Un ambiente con eccessiva elettricità statica può anche causare effetti sulla salute, il più noto dei quali è la lipoatrofia semicircolare (LS).

Strategie

È importante controllare il sistema di condizionamento-ventilazione per assicurarsi che funzioni correttamente e non secchi l'ambiente. Potrebbe essere necessario aggiungere umidificatori per aumentare l'umidità relativa al 50-60%.
È importante controllare l'impianto elettrico sul luogo di lavoro e assicurarsi che i collegamenti a terra siano ben realizzati.
Evita materiali sintetici per indumenti e cerca tessuti con trattamenti antistatici per rivestimenti per pavimenti (tappeti e moquette) e sedie.
Limitare i materiali metallici dei mobili e dell'ambiente.
È inoltre importante limitare i campi elettromagnetici ad alta frequenza presenti nell'ambiente, in quanto la loro presenza favorisce un'eccessiva elettricità statica.

Opportunità

I moderni edifici per uffici sono più suscettibili all'eccessiva elettricità statica, data la loro elevata elettrificazione e la presenza di reti mobili, nonché la tendenza all'utilizzo di materiali leggeri e metallici. Al momento, invece, le abitazioni sono meno problematiche, anche se si sono verificati occasionali casi di LS.

Difficoltà

I fattori che determinano l'eccessiva elettricità statica all'interno di un edificio sono molteplici e diversificati, rendendo complesso trovare l'origine del problema e la soluzione definitiva da applicare caso per caso. La consulenza di un esperto è di grande valore per prevenire e risolvere problemi di questo tipo.

Radiazioni elettromagnetiche a bassa frequenza

All'interno degli edifici è presente un'ampia gamma di sorgenti di campi elettrici e magnetici (CEM) a bassa frequenza (0-30kHz): cabine e contatori di ascensori, cavi elettrici, piccoli e grandi elettrodomestici, televisori, computer, lampade, allarmi... È è importante prendere le dovute precauzioni e garantire una corretta installazione e utilizzo di tutti loro per ridurre al minimo i possibili effetti negativi della generazione di campi elettrici e magnetici indesiderati.

Strategie

È importante garantire una corretta installazione elettrica all'interno, con i cavi ben schermati e le necessarie prese di terra con la minore resistenza possibile. Deve essere un tecnico competente che svolge questo compito al fine di garantire il rispetto delle norme che, se correttamente applicate, consentono un cablaggio elettrico sicuro, affidabile e salubre.
I grandi elettrodomestici (frigorifero, forno, lavatrice, ecc.) generano campi elettromagnetici intensi in raggi da 2 a 3 metri, quindi è importante non posizionarli a parete con testiere o spazi di lavoro o studio a lungo termine. Piccoli elettrodomestici come televisori o computer generano campi elettromagnetici a distanze più brevi; è quindi importante limitarne l'uso o mantenersi a distanza di sicurezza (ad esempio guardare la TV ad almeno 1 metro di distanza). È importante che siano scollegati quando non vengono utilizzati.
Si ricorda che i radiatori e le stufe elettriche devono essere dotati di spine di tipo schuko e di un buon collegamento a terra.
Un elemento da cui stare alla larga sono le stazioni di trasformazione.

Opportunità

Tornerà in futuro un uso attento degli elettrodomestici non solo per evitare problemi di salute ma anche per risparmiare sui consumi elettrici.

Difficoltà

Gli effetti sulla salute dei campi elettrici e/o magnetici sono diversi e in molti casi ancora poco caratterizzati, rendendo difficile stabilire la relazione tra la salute e l'inquinamento elettromagnetico presente negli spazi in questione.

Radiazioni elettromagnetiche ad alta frequenza

Attualmente la principale fonte di campi elettromagnetici ad alta frequenza (CEM) (30kHz-300GHz) sono i sistemi a radiofrequenza per la trasmissione di informazioni su lunghe distanze come telefoni cellulari, telefoni cordless con tecnologia DECT, sistemi wifi, smart TV, microonde, baby wireless monitor, ecc. Gli effetti sulla salute dovuti all'esposizione a questi tipi di onde generano ancora molte polemiche. Inoltre, sempre più persone mostrano una sensibilità elettromagnetica alle alte frequenze.
Esistono diverse misure precauzionali che possono aiutare chi già soffre dei sintomi ed essere utili per il resto degli utenti come metodo di prevenzione.

Strategie

Si consiglia di spegnere i router wifi quando dormiamo o quando non sono in uso, per evitare di essere esposti inutilmente alle onde.
Le raccomandazioni per l'uso dei telefoni cellulari indicano che è meglio utilizzarli a una distanza prudente dal corpo, con sistemi vivavoce o simili, e di evitare un uso prolungato quando i livelli di copertura sono bassi, in quanto il telefono emette una maggiore intensità di radiazioni. Si raccomanda inoltre di non lasciarli in funzione quando dormiamo sul comodino o vicino alla testata.
Per computer e tablet, si consiglia di utilizzare una connessione cablata quando possibile. Quando questo non viene utilizzato, è opportuno disattivare la connessione wireless del dispositivo (tramite modalità aereo), per una maggiore sicurezza.
Si raccomanda inoltre di evitare sistemi di monitoraggio del bambino senza fili che emettono radiazioni ad alta frequenza. Il mercato offre alternative come sistemi di cavi o dispositivi che certificano basse emissioni.
È utile iniziare misurando le radiazioni esistenti e, in alcuni casi, è possibile utilizzare vari sistemi di schermatura per schermare le radiazioni ad alta frequenza che possono essere causate da torri cellulari o dispositivi Wi-Fi vicini, come tende, speciali vernici di grafite o metallo maglie. È importante parlare con un esperto del settore al momento di decidere il miglior sistema da installare.

Opportunità

Le misure di prevenzione possono a lungo termine evitare potenziali problemi di salute che possono derivare dall'ignoranza dell'effetto causato dall'esposizione a lungo termine. Il rapporto Bioinitiative 2012 esamina i risultati di circa 1.800 studi scientifici e conclude che esistono prove di rischi per la salute delle persone dovuti alla presenza di campi elettromagnetici e all'uso di tecnologie wireless.

Difficoltà

Nonostante gli studi esistenti, gli effetti sulla salute dei campi elettromagnetici ad alta frequenza non sono ancora stati tipizzati, quindi le persone che mostrano sensibilità nei loro confronti hanno più problemi a essere riconosciuti e a porre rimedio al loro problema.

Strumento completo che guida professionisti e utenti nell'implementazione di strategie per migliorare l'efficienza energetica e il comfort degli edifici. Suddiviso in tre sezioni principali – Misure Attive, Misure Passive, e Salute e Comfort – l'Atlante fornisce una panoramica delle migliori pratiche e tecnologie disponibili.

FATTORI TRAINANTI

Riduzione dei costi energetici: Le misure attive e passive contribuiscono a una notevole riduzione dei costi operativi a lungo termine, incentivando l'adozione di strategie più efficienti.

Benefici per il benessere degli occupanti: Garantire condizioni ambientali ottimali migliora la qualità della vita e la produttività degli utenti, rendendo le soluzioni incentrate su salute e comfort particolarmente attraenti.

Sostenibilità ambientale: L'uso di materiali sostenibili e di energie rinnovabili supporta gli obiettivi globali di riduzione delle emissioni di carbonio e promozione di edifici a basso impatto ambientale.

PUNTI CRITICI

Dipendenza dalle tecnologie attive: Nonostante l'efficienza migliorata, le tecnologie attive richiedono ancora una significativa spesa iniziale e un monitoraggio continuo per massimizzare i benefici.

Sfide nell'implementazione delle misure passive: Non tutti gli edifici esistenti sono facilmente adattabili a soluzioni passive, e questo può limitare l'efficacia delle strategie di efficienza energetica.

Complessità del comfort ambientale: L'integrazione di salute e comfort richiede un equilibrio tra diverse variabili, come la qualità dell'aria e il comfort termico, che non sempre sono facili da gestire contemporaneamente.

VALUTAZIONE DEI CRITERI SMART PER LA DIGITALIZZAZIONE DEL PATRIMONIO COSTRUITO E PROPOSTE DI INTERVENTO

Scillato; ©Luisa Lombardo, 2023

“BORGHI DIGITALI”

La pandemia ha acuito la crisi dei piccoli negozi locali, già alle prese da alcuni anni con un calo delle vendite. Tra il 2012 e il 2020 hanno chiuso i battenti oltre 77 mila attività di commercio al dettaglio e, secondo stime dell’Ufficio Studi Confcommercio, nel 2021 il loro numero rischia di ridursi ulteriormente, in particolare nei centri storici dei capoluoghi di provincia e in alcune città di medie dimensioni.

Uno scenario in cui un aiuto può arrivare dall’ecommerce che ha visto una crescita boom negli scorsi mesi: complici le restrizioni agli spostamenti, anche i consumatori più senior hanno infatti scoperto i vantaggi degli acquisti via web e più in generale di un approccio multicanale in cui online e offline si integrano e convivono con l’obiettivo di migliorare il più possibile la customer experience. Di qui la scelta da parte di un numero crescente di aziende di far leva sul digitale per rilanciare o espandere il business.

Si inserisce in questo contesto il lancio della seconda edizione del progetto “Borghi Digitali”, promosso da eBay e Confcommercio per aiutare i negozi dei piccoli borghi ad aprirsi alle opportunità offerte dall’ecommerce. Le eccellenze che questi borghi custodiscono sono un patrimonio molto importante che va valorizzato promuovendo un approccio di integrazione vincente tra online e offline, una visione di lungo periodo grazie alla quale l’ecommerce diventa una risorsa in più per le attività commerciali per andare oltre i confini locali, e farsi conoscere in Italia e nel mondo per questo incentiviamo un’idea di Borgo del futuro, dove tradizione e innovazione digitale concorrono al successo di questi territori.

Google ha messo in campo “Italia in Digitale”, una piattaforma creata per accelerare la ripresa economica del Paese attraverso una serie di strumenti gratuiti, tra cui alcuni focalizzati sul settore del turismo: un esempio è la nuova piattaforma ‘Travel Insights’. l tool contiene una serie di strumenti e guide utili per raggiungere i viaggiatori, a disposizione di strutture ricettive, operatori del turismo e agenzie di viaggi. In particolare, in questa si trova ‘Hotel Insights’, per aiutare gli albergatori a scoprire cosa cercano i potenziali viaggiatori di domani, come raggiungerli, e cosa fare per aumentare le prenotazioni future. Inoltre, è anche presente il nuovo strumento ‘Destination Insights’, che “permette di ottenere informazioni utili per esplorare come cambia la domanda turistica nel tempo e monitorare le tendenze di viaggio.

PIATTAFORMA MIRA

Piattaforma della Generalitat Valenciana per la messa in rete di progetti di recupero e volta alla proposizione di progetti esiti di concorsi di idee, in fase di realizzazione o già realizzati in grado di fornire al progettista un quadro esaustivo degli interventi considerati virtuosi e da emulare e riproporre nell’ambito urbano valenciano.

Proposizione di prototipi elaborati dalle Università di Valencia, da progettisti e aziende locali volti alla proposizione di soluzioni tecnologiche innovative per migliorare le condizioni di vita degli abitanti del luogo.

LO STATO DEI LUOGHI

La prima rete nazionale di attivatorə di luoghi e spazi rigenerati a base culturale.
La Rete Lo Stato dei Luoghi è composta da organizzazioni e persone che agiscono sull'attivazione di luoghi, gestione di spazi oppure sono coinvolte in esperienze di rigenerazione a base culturale nel nostro Paese.
Lo Stato dei Luoghi dà priorità all'impatto complesso sulle comunità, risultato sinergico di offerte culturali, sociali, di aggregazione, artistiche, di solidarietà, imprenditoriali ed economiche.
La Rete intende diffondere la conoscenza e promuovere l'avanzamento della discussione pubblica sui temi della rigenerazione urbana a base culturale.

ASSOCIAZIONE CIVITA

L'Associazione Civita opera da oltre 35 anni nel mondo della cultura e si propone come laboratorio e incubatore di progetti per valorizzare il patrimonio culturale italiano. L'Associazione crea connessioni, sinergie e spazi concreti di confronto fra i mondi della cultura, delle Istituzioni e delle imprese. Il ruolo strategico che le aziende svolgono per la sostenibilità e l'innovazione tecnologica è oggi l'impegno di Civita.

- **VALORIZZAZIONE:** Ripartire insieme dalla cultura. Nel nostro Paese tutto è storia e cultura: il paesaggio, l'archeologia, le città e i borghi dal vissuto millenario. Investire in cultura significa farsi carico del nostro patrimonio culturale. Significa restituirlo alla fruizione e alla conoscenza di un pubblico sempre più ampio, con ricadute significative sul tessuto sociale ed economico.

- **SOSTENIBILITÀ:** Cultura e strategie d'impresa, per un futuro sostenibile. La sostenibilità è oggi parte integrante delle strategie d'impresa ed orienta obiettivi e investimenti delle aziende in modo sempre più organico. L'Italia, con il suo immenso patrimonio culturale e il forte legame delle comunità locali alle proprie radici storiche, rappresenta un laboratorio unico per sperimentare nuove politiche di sostenibilità all'insegna del fattore cultura.

- **INNOVAZIONE:** Tecnologia e ricerca al servizio dei luoghi della cultura. La digital transformation contribuisce a far percepire la cultura come una risorsa condivisa, inclusiva e più accessibile, connessa ad un modello di sviluppo sostenibile. Attraverso le nuove tecnologie i luoghi della cultura vengono valorizzati in modo innovativo, favorendo la collaborazione tra aziende tecnologiche e operatori del settore culturale.

Polizzi Generosa; ©Livia Gino, 2024

SPOTIFY

Un viaggio in Italia attraverso 100 tra i borghi più rappresentativi. Oggi è possibile grazie ai 100 borghi del cuore scelti da “SiViaggia”, la nuova serie in podcast che esplora le bellezze nascoste nel nostro territorio.

VISIT MADONIE

Visit Madonie potrebbe essere una piattaforma innovativa che unisce tutti i comuni del comprensorio delle Madonie, offrendo una panoramica completa e integrata delle attività, eventi e iniziative presenti sul territorio. Ogni comune potrà avere il proprio portale dedicato, come Visit Petralia, Visit Polizzi Generosa, Visit Castelbuono, ecc., dove cittadini, ma soprtattutto turisti, potranno scoprire mese per mese eventi culturali, spettacoli, manifestazioni e opere pubbliche.

La piattaforma non solo facilita l’accesso alle informazioni, ma promuove anche la condivisione di attività comuni tra i vari paesi, creando un network che valorizza il patrimonio naturale, storico e culturale delle Madonie. Visit Madonie potrebbe rappresentare un punto di riferimento per chi vuole vivere appieno le tradizioni, la cultura e le bellezze del territorio, offrendo un’esperienza unica e completa grazie alla collaborazione tra i vari comuni.

Con un’interfaccia semplice e intuitiva, favorendo l’UX, il portale potrebbe consentire di esplorare le proposte locali, pianificare le visite e partecipare a iniziative di interesse comune, creando una rete dinamica e sempre aggiornata che rende le Madonie una destinazione vivace e in continua evoluzione.

Digitalizzazione, innovazione e competitività, cultura e turismo. Sono queste le parole del successo per uno "smart village". Così come sono importanti gli investimenti al fine di provuomere e rinnovare gli eventi in programma nel comprensorio, risulta altresì importante pubblicizzare le feste, le usanze contadine, le sagre e il folcore presente sulle Madonie. I social networks, ad oggi, costituiscono un mezzo di comunicazione efficace per diffondere la cultura insita dei borghi delle Madonie. Dirette, reels, profili social dedicati e piattaforme comuni a tutti i paesi del comprensorio al fine di concentrare e distribuire in tutti i comuni il turismo.

ECCE HOMO A SCLAFANI BAGNI

Nel mese di giugno, a Sclafani Bagni, si celebra la festa religiosa Ecce Homo. La statua, realizzata in cartapesta, è molto antica, ed è custodita nella cappella della Chiesa Madre. Per l'occasione viene portata in processione solenne lungo le vie del paese, in un'atmosfera suggestiva di partecipazione e devozione.

SAGRA DELLE NOCCIOLE A POLIZZI GENEROSA

Festeggiata nel mese di Agosto, le nocciole sono un prodotto tipico prelibato insieme ai numerosi dolci che si preparano con questo ingrediente insieme a molti altri prodotti tipici siciliani. Il paese si riempie di capanne di legno costruite per l'occasione e per le strade è possibile vedere asinelli e carretti siciliani che trasportano i prodotti e rappresentazioni degli antichi mestieri.

RADUNO MEDITERRANEO DEL FOLKLORE INTERNAZIONALE A PETRALIA SOTTANA

In agosto a Petralia Sottana si svolge il Raduno Mediterraneo del folklore Internazionale. Questo bellissimo festival si tiene ormai da trent'anni e in pochi giorni il paese diventa un palcoscenico di arte, danza, rappresentazioni teatrali, concerti. Gli artisti sono italiani ed internazionali e si dedicano alla cultura folk del proprio paese. Molta attenzione per la tradizione locale e per gli strumenti musicali tipici siciliani tra cui il tamburello e il friscaletto.

SAGRA DELLA SPIGA E FESTA DEI BURGISI A GANGI

Nel mese di agosto a Gangi si svolge la Sagra della Spiga e festa dei Burgisi. Questa sagra nasce nel mondo contadino e vuole celebrare l'abbondanza con le spighe di grano protagoniste di un bellissimo corteo legato alle antiche divinità greche. La più importante è Demetra o Cerere, madre del grano e dea dell'abbondanza.

BALLO DELLA CORDELLA A PETRALIA SOTTANA

In agosto il Ballo della Cordella è la rievocazione di antiche usanze contadine pagane. SI svolge nell'ambito del Corteo Nuziale, in abiti settecenteschi. Chiamato anche Ballo Pantomima della Cordella, è un augurio agli sposi. 12 coppie di danzatori, reggono nastri colorati, tutti legati ad un palo con in cima un mazzo di spighe di grano. Danzando, i nastri vengono intrecciati con movimenti precisi, per augurare fecondità e abbondanza alla nuova coppia di sposi.

GIOSTRA DEI VENTIMIGLIA A GERACI SICULO

In agosto, la Giostra dei Ventimiglia è una bellissima rappresentazione storica con una giostra a cavallo che vuole celebrare la famiglia Ventimiglia e il periodo in cui regnava sul territorio delle Madonie, lungo quasi due secoli. Un bellissimo corteo storico in costume e tanti giochi cavallereschi, tra cui il gioco del saraceno, dove ogni cavaliere armato di asta dovrà colpire un fantoccio di legno; la giostra degli anelli e la giostra della rosa.

SAGRA DEL FINOCCHIETTO SELVATICO DI BLUFI

La seconda domenica di maggio si celebra un prodotto tipico dalla bontà e dalle caratteristiche gastronomiche uniche: il finocchietto selvatico. La Sagra rientra nel piano promozione dei cittadini di Blufi, che intendono promuovere l'alimento "Foeniculum Volgare" dal valore nutrizionale elevatissimo e dalle proprietà stimolanti, digestive, antisettiche e diuretiche. La raccolta locale del finocchietto selvatico nelle campagne limitrofe viene eseguita manualmente dai cittadini e preparato secondo le ricette della tradizione locale.

FESTA DELLA TRANSUMANZA A GERACI SICULO

Le transumanze più importanti di Geraci sono due: una si svolge il 24 Maggio, quando gli animali si dirigono sui monti di demanio comunale; l'altra il 19 Novembre, quando si torna a valle nei terreni rigogliosi dei rispettivi pastori. Da qualche anno è candidata a patrimonio immateriale dell'umanità. Protagonisti dell'evento sono le mandrie che, durante il passaggio attraverso il centro abitato, con il loro scalpitìo e i loro campanacci, creano un'atmosfera unica nel suo genere.

"ULTIMU MIERCULU" A POLIZZI GENEROSA

Festa annuale dei polizzani per il loro Santo patrono, Gandolfo da Binasco, festeggiata quattro volte durante l'anno. L'11 Gennaio quando si ricorda lo scampato pericolo in seguito al terribile terremoto del 1693; il Lunedì dell'Angelo, per ricordare la sua morte avvenuta il Sabato Santo del 1260; il settimo mercoledì dopo Pasqua, presso l'Eremo, ove si presume che Gandolfo abbia sostato prima di giungere in paese, e abbia dato la parola e l'udito ad un sordomuto; infine, per tre giorni consecutivi, a cavallo della terza domenica di Settembre quando si svolgono varie processioni e cerimonie religiose.

INFIORATA A CASTELBUONO

Infiorata artistica con stand espositivi di enogastronomia e artigianato, mostre, convegni, spettacoli, degustazioni, visite guidate, escursioni nel territorio. L'infiorata si svolge lungo la via Sant'Anna con la riproduzione e l'allestimento dei bozzetti floreali, a cura degli Infioratori, delle Associazioni e delle scolaresche di Castelbuono. I bozzetti vengono realizzati con varie tecniche e ricoperti da petali di garofani freschi e gerbere, a questo materiale ne vengono affiancati altri raccolti nelle campagne delle Madonie nei giorni che precedono l'Infiorata.

INFIORATA DEL CORPUS DOMINI A PETRALIA SOTTANA

Nata dall'idea e dall'estro creativo di alcuni giovani locali, levento "Arte del Corpus Domini" è ormai divenuto un appuntamento fisso ed ogni anno viene riproposto nelle piazze caratteristiche di Petralia Sottana. Mediante l'impiego di sale, terriccio, sabbia, petali di fiori e di materiale necessario alla rifinitura di alcuni particolari, vengono realizzate figure artistiche variopinte sul suolo delle piazze e dei particolari angolo del paese.

INFIORATA DI CARTI RIZZI A CASTELBUONO

L'infiorata dei Carti Rizzi di Castelbuono si svolge ogni anno in occasione della festa del Corpus Domini. È l'unica infiorata realizzata in Italia con la carta. La tradizione dei cosiddetti "carti rizzi" risale a qualche decennio fa. All'epoca i bambini del paese tagliavano lunghe strisce di carta, le arricciavano e le spargevano sulla strada poco prima del passaggio delle processioni del Corpus Domini.

FESTA DEI SANTI PIETRO E PAOLO A PETRALIA SOPRANA

La Festa dei Santi Pietro e Paolo a Petralia Soprana diventa un'occasione religiosa che viene sfruttata anche per far conoscere il territorio e le sue eccellenze non solo culturali ma anche gastronomiche e folkloristiche. Il programma degli appuntamenti prevede due giorni intensi durante i quali le celebrazioni religiose e le processioni vengono intervallate da momenti più ludici e profani.

FESTA DI SAN CALOGERO A PETRALIA SOTTANA

La festa è preceduta dalla tradizionale "Sittina a San Calò" celebrata la mattina, dall'11 al 17 di giugno, nella Basilica Madre straripante di fedeli. Nei due giorni di festa si svolgono i riti religiosi con la tradizionale fiaccolata della vigilia e la solenne processione del Simulacro per le vie principali del paese. Le campane suonano a festa con i colpi di mortaio che scandiscono i nove rintocchi del campanone accompagnati da "a scampaniata" e da "a maschiata forti". Nel pomeriggio, il pesante fercolo, "A Vara", viene portato a spalla da uomini vigorosi percorrendo le vie principali del paese con i fedeli scalzi per voto a chiedere dispense e miracoli, mentre una moltitudine di gente e devoti commossi acclamano il Santo Patrono di Petralia Sottana.

FESTA DI SAN GIOVANNI A CASTELBUONO

La Festa di San Giovanni a Castelbuono è una tradizionale sagra durante la quale, per le vie del nostro paese, sono messe a bollire nelle "quarare" (grandi recipienti di rame) fave secche e patate che poi saranno offerte gratuitamente a tutti i passanti.

DIVINO FESTIVAL A CASTELBUONO

Il Festival è diventato un appuntamento importante per gli appassionati di buon cibo e vino di qualità. L'edizione 2023 si terrà dal 30 giugno al 2 luglio e prevede tre giorni di eventi, spettacoli, incontri, degustazioni e il Premio Internazionale Gusto Divino, che vedrà tra i suoi ospiti premiati Oscar Farinetti, fondatore di Eataly e proprietario di alcune delle più grandi cantine italiane. L'evento vedrà la partecipazione di aziende vitivinicole di fama da tutta Italia e di grandi personalità del mondo enogastronomico.

FESTA DI SANT'ANNA A CASTELBUONO

La Festa di Sant'Anna a Castelbuono è un evento che combina manifestazioni popolari, celebrazioni religiose e tradizioni storiche. Inizia con il ritorno simbolico del Principe Giovanni III Ventimiglia e la reliquia di Sant'Anna, seguito dalla novena dal 17 al 24 luglio con messe e processioni. Il 25 luglio si svolge la Cerimonia della consegna delle chiavi e il Corteo Storico Ventimigliano, rievocazione storica con la partecipazione dei quartieri storici. Il 26 luglio è dedicato alle celebrazioni eucaristiche, pellegrinaggi, e il Giro podistico internazionale. Il 27 luglio si conclude con la processione della vara della Patrona e il sacro teschio di Sant'Anna, coinvolgendo l'intera comunità in preghiera e ringraziamento. Nel primo pomeriggio si procede all'addobbo dell'antichissima vara della Patrona, allestita nel cortile del castello. Verso le ore 16 i mastri di vara si chiudono in cappella per adornare e ripulire il reliquiario. Subito dopo a braccio lo conducono giù fino al cortile, preceduti da due bambine con le candele. Dopo le procedure di sistemazione dell'urna, la vara viene posta al centro del cortile e i pellegrinaggi si moltiplicano. Il centro nevralgico della festa si sposta dalla Cappella (disadorna) al cortile. Nel pomeriggio è pia usanza castelbuonese compiere ù viaggiu fino al cortile e sostare qualche minuto in preghiera, ringraziando la Santa per le grazie ricevute. Il tradizionale Rosario di scavisi è tornato a risuonare tra le pietre del castello, a seguire la solenne processione del sacro teschio di Sant'Anna con il gruppo statuario della Madonna del Rosario. La processione è lunghissima, poiché vi partecipano tutti i confratelli nel tradizionale abito scuro, a maniche lunghe, coperto dall'abitino (bavero che indica la confraternita d'appartenenza).

FESTA DEI CURGISI A GANGI

La Festa dei Burgisi, celebrata la prima domenica di agosto a Gangi, è un'espressione di profonda religiosità e del legame ancestrale del popolo con la terra e i suoi frutti. Una celebrazione cristiana di ringraziamento al Creatore che assicura il ciclo delle stagioni e la sussistenza attraverso il raccolto. In questo contesto, il pane assume un ruolo centrale: sei gigantesche forme portate in processione da giovani in costume locale simboleggiano l'unione del prodotto della terra e del lavoro dell'uomo.

Le radici della festa affondano nel tempo, tramandate da alcune famiglie contadine benestanti che possedevano bestiame e terra, elementi che conferivano loro distinzione sociale rispetto alla maggioranza dei contadini dipendenti dai nobili proprietari terrieri. Il termine "burgisi" deriva proprio da "borghese".

La ritualità della Festa dei Burgisi si differenzia nettamente dal Corteo di Cerere, che rappresenta il culmine della Festa della Spiga, con la sua rappresentazione mitologica pagana e il rito propiziatorio per un buon raccolto. Pur con alcuni punti in comune, la contrapposizione tra religiosità cristiana e pagana è forte, entrambe però ricche di significato e intrise di una profonda simbologia che ruota attorno al lavoro dell'uomo e ai frutti della terra.

La Festa dei Burgisi offre un'immersione unica nella tradizione siciliana, un'occasione per vivere la religiosità popolare e il legame con la terra in un contesto suggestivo. Un evento da non perdere per chi ama la cultura e le feste autentiche.

Ypsigrock; ©ypsigrock.it, 2023

Nonostante questi punti critici, l'adeguamento acustico è un investimento importante per la salute, il benessere e la qualità della vita delle persone. Con il continuo sviluppo di tecnologie innovative, la riduzione dei costi e l'aumento della consapevolezza, l'adeguamento acustico diventerà sempre più importante nella progettazione e nella gestione degli edifici e degli ambienti.

FATTORI TRAINANTI

Miglioramento della qualità della vita: Un ambiente con un buon comfort acustico contribuisce a migliorare la qualità della vita delle persone, riducendo l'inquinamento acustico e i suoi effetti negativi sulla salute e sul benessere.

Incremento della produttività: Un ambiente lavorativo con un buon comfort acustico può migliorare la concentrazione e la produttività dei lavoratori.

Miglioramento dell'apprendimento: Un ambiente scolastico con un buon comfort acustico può migliorare l'apprendimento degli studenti.

Tutela della salute: L'inquinamento acustico può avere effetti negativi sulla salute, come stress, disturbi del sonno, problemi di udito e malattie cardiovascolari. L'adeguamento acustico degli edifici e degli ambienti contribuisce a ridurre questi rischi.

Aumento del valore immobiliare: Un immobile con un buon comfort acustico ha un valore di mercato più alto rispetto a un immobile non adeguato acusticamente.

PUNTI CRITICI

Costi elevati: L'adeguamento acustico di un edificio può essere costoso, soprattutto per edifici complessi o di grandi dimensioni.

Difficoltà tecniche: L'adeguamento acustico può richiedere interventi invasivi sulla struttura dell'edificio, che possono essere complessi da realizzare e possono comportare disagi temporanei agli occupanti.

Mancanza di consapevolezza: Non tutti sono a conoscenza dell'importanza dell'adeguamento acustico e dei rischi dell'inquinamento acustico.

Barriere normative: In alcuni casi, le normative edilizie o gli standard di finanziamento possono ostacolare l'adeguamento acustico degli edifici.

Mancanza di incentivi: In alcuni casi, non ci sono incentivi sufficienti per incoraggiare i proprietari o gli amministratori di condominio a effettuare interventi di adeguamento acustico.

VALUTAZIONE DEI CRITERI SMART PER LA FORMAZIONE DI COOPERATIVE DI COMUNITÀ

Castelbuono; ©Carmelo Di Salvo, 2022

LE COOPERATIVE DI COMUNITÀ

Le Cooperative di Comunità costituiscono un modello di innovazione sociale nel quale i membri di una determinata comunità si organizzano per essere sia produttori che consumatori di beni o servizi, promuovendo sinergie, opportunità di crescita e coesione all'interno della stessa. Queste cooperative, mettendo insieme le risorse e le attività dei singoli cittadini, delle imprese, delle associazioni e delle istituzioni, sono in grado di rispondere a una vasta gamma di esigenze di solidarietà.

Istituite in conformità alla LEGGE 27 dicembre 2018, n. 25 - Norme per la promozione, il sostegno e lo sviluppo delle cooperative di comunità nel territorio siciliano, le cooperative di comunità non rappresentano semplicemente un'evoluzione, ma piuttosto una moderna reinterpretazione dello spirito cooperativo originario, sancito e promosso dall'articolo 45 della Costituzione italiana. Questo modello va oltre la mera solidarietà circoscritta ad ambiti e gruppi professionali specifici, aprendosi alla società nel suo insieme e dedicando le sue attività al benessere generale dell'intera comunità. Di conseguenza, si configura come un modello di innovazione sociale al servizio della collettività, in stretta collaborazione con vari attori, come imprese, istituzioni e associazioni, per affrontare le molteplici esigenze di solidarietà.

La recente normativa approvata in Sicilia permette di definire le cooperative di comunità non in base a un particolare settore lavorativo, utenza specifica o attività svolta, ma piuttosto in base alla valorizzazione della società di cui i membri fanno parte, alle competenze della popolazione locale, alle tradizioni culturali e alle risorse territoriali. L'obiettivo è quello di soddisfare i bisogni della comunità locale e migliorare la qualità della vita sia sociale che economica, attraverso lo sviluppo di attività economiche orientate alla sostenibilità, alla valorizzazione di risorse ambientali e monumentali e alla creazione di opportunità di lavoro per la comunità stessa. Questo nuovo strumento cooperativo, che può essere di rilevanza pubblica e sociale per i servizi offerti o per le attività svolte in contesti particolarmente svantaggiati, potrà anche beneficiare del sostegno dei fondi europei (FESR, FSE, FEASR, FEAMP).

1. L'individuazione dei bisogni comuni

Le Cooperative di Comunità sono prevalentemente presenti in territori caratterizzati da condizioni di vulnerabilità e da specifiche necessità, che possono costituire anche opportunità imprenditoriali. Tali contesti non si limitano alle sole aree montane, ma coinvolgono anche paesi, borghi di pianura e quartieri urbani. Il contesto territoriale svolge un ruolo cruciale nella formazione e nel successo delle Cooperative di Comunità. Queste nascono in aree dove la creazione di una cooperativa serve a contrastare la marginalizzazione sociale ed economica, favorendo al contempo il rinnovamento di quel territorio. Le priorità delle cooperative di comunità restano strettamente connesse al territorio stesso, alle reali esigenze percepite dalla maggior parte della comunità e all'impegno nel servire la collettività. Per fornire risposte efficaci, è fondamentale possedere competenze di analisi (che includono l'identificazione non solo dei bisogni, ma anche delle risorse disponibili o potenzialmente coinvolgibili) e di progettazione (basata su un approccio unitario e partecipativo).

2. I promotori e i fondatori

Le Cooperative di Comunità possono essere istituite sia da iniziative di privati cittadini che su impulso di entità istituzionali.

Indipendentemente dalla natura del gruppo promotore, che può comprendere singoli individui, associazioni o istituzioni locali, le cooperative tendono a sorgere e a prosperare maggiormente quando possono contare su un nucleo fondatore estremamente coeso e su una leadership forte.

La coesione del gruppo e la presenza di una figura carismatica sono fattori praticamente indispensabili per il successo di una Cooperativa di Comunità.

3. La definizione dell'idea e valutazioni preliminari

La fase iniziale di qualsiasi startup è contraddistinta dalla concezione di un'idea: un concetto innovativo per soddisfare un bisogno, cogliere un'opportunità di mercato o rispondere a una necessità esistente nella comunità di appartenenza.

Nella Cooperativa di Comunità, l'obiettivo principale è generare benefici per l'intera comunità.

È fondamentale delineare chiaramente e in modo appropriato l'idea imprenditoriale, identificare le competenze necessarie, analizzare e valutare le potenziali criticità, valutando anche il ricorso al supporto di professionisti ed esperti del settore.

Processo per le Cooperative di Comunità ; ©https://funnel.coopdicomunita.eu/, 2023

4. Il coinvolgimento della comunità

Il processo di creazione di una cooperativa di comunità beneficia notevolmente della presenza di un ambiente territoriale favorevole alla nascita e allo sviluppo dell'impresa. Dopo il primo impulso iniziale, la cooperativa necessita di una solida infrastruttura socio-relazionale su cui fare affidamento.

Le Pro Loco, le parrocchie, le associazioni territoriali, gli imprenditori locali, le istituzioni di credito locali e le fondazioni bancarie, così come la pubblica amministrazione, sono solo alcuni degli attori territoriali che il progetto cooperativo può coinvolgere al fine di ottenere consenso e costruire relazioni produttive. Questo coinvolgimento può avvenire attraverso varie modalità, quali la disponibilità di spazi fisici, attrezzature, personale, risorse finanziarie, idee progettuali, e altro ancora. L'obiettivo finale è coinvolgere il più ampio numero possibile di soggetti e attori locali nel progetto cooperativo per lo sviluppo sostenibile del territorio.

Le potenziali cooperative di comunità devono quindi essere in grado di valorizzare le risorse e le energie locali al fine di attrarre e trattenere i membri della comunità per favorire il rilancio economico e sociale del territorio.

Per garantire la condivisione del progetto, è fondamentale coinvolgere la comunità fin dalle fasi iniziali, organizzando incontri e assemblee volte a illustrare i principali elementi caratterizzanti della Cooperativa di Comunità, come la composizione della base sociale, la vocazione inclusiva e il modello di governance, oltre al suo modello di business. Sebbene possano esistere differenze nelle partnership iniziali, è consigliabile pianificare in seguito partnership strategiche più ampie che coinvolgano tutti gli attori rilevanti della comunità, sia pubblici che privati.

5. La condivisione del progetto imprenditoriale

L'incontro con i potenziali collaboratori interessati a stabilire una partnership imprenditoriale con la futura cooperativa è di fondamentale importanza.

Questi momenti di confronto non solo facilitano la condivisione di idee, ma contribuiscono anche a creare relazioni solide e sinergiche.

Queste forme di collaborazione possono costituire una risorsa preziosa per la realizzazione e lo sviluppo dell'iniziativa, offrendo un'opportunità per valutare la percezione dell'idea imprenditoriale, la sua fattibilità effettiva, gli aspetti da ulteriormente sviluppare e la pianificazione dei passaggi successivi.

Le partnership strategiche esterne alla comunità rappresentano un'opportunità per la cooperativa di accedere a risorse e aumentare la propria visibilità al di fuori del contesto locale di appartenenza.

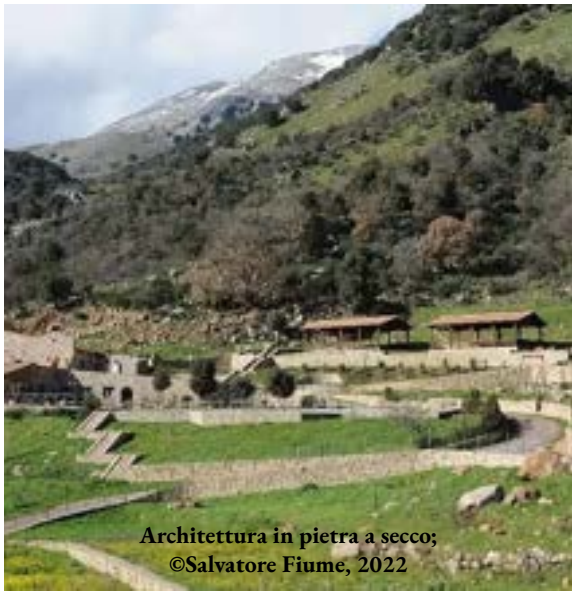
Madonie; ©Salvatore Fiume, 2022

6. La strategia e il modello di business

È imprescindibile elaborare una strategia condivisa, basata sull'identificazione e sull'analisi dei bisogni, al fine di trasformarla in progetti e azioni coerenti all'interno di un piano organico.

Tale piano deve includere una pianificazione temporale delle attività necessarie per avviare e sviluppare il progetto.

Durante questa fase, il gruppo promotore deve concentrarsi principalmente sul modello di business e sulle strategie per raggiungere gli obiettivi prefissati. Diventa quindi essenziale definire cosa si intende produrre/offrire e secondo quali condizioni, insieme alle modalità e ai mezzi (strumentali, organizzativi e finanziari) con cui ciò sarà realizzato. È altresì cruciale identificare i target prioritari (utenti-clienti) a cui rivolgersi.



Architettura in pietra a secco;
©Salvatore Fiume, 2022

7. Il piano marketing

Affermare l'identità, le strategie e i servizi rappresenta uno dei presupposti fondamentali della strategia di marketing di una cooperativa di comunità. A differenza di altre imprese, una cooperativa di comunità deve particolarmente comunicare il reale valore "istituzionale" della propria attività.

Dato che una parte significativa dell'attività si rivolge ai servizi alla persona, è essenziale che il valore dell'attività non si limiti alla relazione tra la cooperativa e gli utenti/clienti, ma sia percepito e compreso dall'intera comunità di riferimento.

Ciò implica per le cooperative di comunità la necessità di sviluppare un piano di marketing e comunicazione che consenta loro di costruire un "vantaggio identitario", partendo da un'analisi dei punti di forza/debolezza, delle opportunità/minacce presenti sul territorio.

I passaggi successivi comporteranno la definizione delle strategie più appropriate per delineare i seguenti elementi:

- Prodotto/servizio: la natura e le caratteristiche distintive del prodotto o del servizio offerto.
- Prezzo: la politica dei prezzi adottata per il prodotto/servizio.
- Distribuzione: i canali attraverso i quali il prodotto/servizio sarà reso disponibile al pubblico (online, offline, consegna a domicilio, spazi condivisi, ecc.).
- Promozione: le modalità attraverso le quali il prodotto/servizio viene presentato e promosso ai potenziali utenti o acquirenti, identificando le strategie di comunicazione più efficaci in base al pubblico di riferimento e alle risorse disponibili.

8. La sostenibilità economica - finanziaria

La sostenibilità economica-finanziaria rappresenta un requisito fondamentale per la durata nel tempo di una Cooperativa di Comunità, così come per qualsiasi altra impresa.

Le Cooperative di Comunità si propongono di rigenerare la comunità e il territorio in cui operano; ciò richiede una serie di investimenti significativi, come la riconversione di edifici dismessi, la costruzione di nuove strutture e il ripristino dei luoghi di aggregazione sociale.

Tuttavia, la capacità di investimento delle cooperative di comunità dipende da diversi fattori:

- Integrazione con il tessuto comunitario: senza il sostegno della comunità e delle amministrazioni locali, le cooperative faticano a legittimarsi e a ottenere i luoghi su cui investire.
- Sviluppo di una filiera integrata di servizi e prodotti: la possibilità di creare contemporaneamente una filiera produttiva per il mercato esterno e offrire servizi integrati ai cittadini può consentire alle cooperative di massimizzare i benefici e le risorse finanziarie.
- Propensione dei soci a contribuire con risorse proprie o ad accedere a finanziamenti: sono i soci della cooperativa a finanziare direttamente gli investimenti.

In caso di accesso a finanziamenti o contributi esterni, è importante considerarli come opportunità per potenziare lo sviluppo dell'impresa, piuttosto che adattare il progetto imprenditoriale al finanziamento disponibile. È cruciale preparare un business plan come guida interna per il processo imprenditoriale e come strumento esterno per presentare il progetto a potenziali finanziatori.

Polizzi Generosa; ©Luisa Lombardo, 2023

9. La costituizione della cooperativa di comunità

A questo punto si procede alla costituzione formale della Cooperativa e all'espletamento delle altre pratiche amministrative necessarie per l'avvio delle attività.

La Cooperativa di Comunità deve adottare un modello di governance il più inclusivo possibile, che sia partecipato e rappresentativo della composizione sociale della comunità stessa.

Da un lato, tutti coloro interessati all'attività della Cooperativa devono poter diventare soci: persone fisiche, enti giuridici, e enti locali.

Dall'altro lato, è importante coinvolgere una varietà di altri soggetti, inclusi gli utenti, i lavoratori, i potenziali finanziatori e altri cittadini, al fine di sfruttare le opportunità che attori con esperienze diverse possono individuare, cogliere e sviluppare.

I primi passi comprendono la redazione dell'Atto Costitutivo e dello Statuto (tramite un Notaio) e l'iscrizione nel Registro delle Imprese presso la Camera di Commercio. All'atto dell'iscrizione, la Camera di Commercio (in collaborazione con l'Agenzia delle Entrate) assegna il Codice Fiscale e la Partita IVA.

Inoltre, l'avvio dell'attività imprenditoriale è soggetto alla denuncia di inizio attività e a varie abilitazioni, autorizzazioni, concessioni o licenze, a seconda del tipo di attività svolta.

Infine, è necessaria l'iscrizione all'Albo Nazionale delle Società Cooperative, tenuto dal Ministero dello Sviluppo Economico e gestito dalle Camere di Commercio.

10. Il lancio dell'iniziativa e del piano di comunicazione

È giunto il momento del lancio dell'iniziativa, durante il quale la Cooperativa di Comunità si presenta ufficialmente al pubblico.

La selezione del nome della cooperativa e la creazione di un segno distintivo (come un logo o un marchio) che richiami il territorio e identifichi la Cooperativa di Comunità rappresentano i primi passi essenziali, in quanto rispondono alla necessità di un riconoscimento interno e preparano il terreno per un riconoscimento esterno.

È fondamentale successivamente creare e mantenere aggiornato un sito web e/o attivare almeno un profilo sui social network. Un evento pubblico di presentazione alla comunità, con diffusione attraverso mezzi di comunicazione come stampa, web e social network, costituirà la prima azione da intraprendere. È inoltre consigliabile comunicare non solo gli eventi e le attività in corso, ma anche i risultati conseguiti. Questo può essere realizzato attraverso l'uso di mailing list dedicate, social network, il sito web e strumenti tradizionali come volantini e manifesti.

Masseria Verbumcaudo; ©Verbumcaudo, 2023

COOPERATIVA SOCIALE VERBUMCAUDO

Nel cuore della Sicilia, tra le dolci colline del Vallone Nisseno e le maestose Madonie, si estende un pezzo di terra che racchiude un'importante testimonianza di impegno civile e memoria storica: una masseria e vasti campi coltivati secondo metodi biologici, situati nei pressi dei comuni di Villalba, Vallelunga Pratameno e Valledolmo.

Questo terreno, che un tempo apparteneva ai fratelli Greco, noti capi della famiglia mafiosa di Ciaculli fino al 1983, è stato confiscato e restituito alla collettività grazie all'azione della giustizia. Oggi, grazie all'iniziativa di undici giovani coraggiosi, questa terra è tornata a essere un simbolo di rinascita e speranza, rigenerata attraverso la fondazione della Cooperativa Sociale Verbumcaudo, che si dedica all'agricoltura biologica di alta qualità.

Le storie personali dei membri della cooperativa riflettono una profonda determinazione e resilienza. Si tratta di giovani professionisti e lavoratori specializzati che hanno deciso di investire nelle loro radici, in un territorio spesso trascurato e vittima di abbandono. Tra di loro si annoverano ingegneri, geologi, guide naturalistiche, agronomi, commercialisti e operai agricoli qualificati, uniti dal desiderio comune di riportare in vita queste terre e trasformarle in una risorsa sostenibile e produttiva. La cooperativa non rappresenta solo un progetto economico, ma una vera e propria battaglia culturale: Verbumcaudo è il simbolo del riscatto sociale e della volontà di una generazione che non vuole cedere alla logica dell'emigrazione o della rassegnazione, ma che, al contrario, lotta per il diritto di rimanere nelle proprie terre, di lavorare con dignità e di creare un futuro migliore per sé e per la comunità.

Il percorso della cooperativa Verbumcaudo è sostenuto da un importante progetto di sviluppo, finanziato dalla Fondazione con il Sud e dalla Fondazione Peppino Vismara. Tale progetto, realizzato dal Consorzio Agrietica in sinergia con i comuni di Polizzi Generosa e Valledolmo, Confcooperative Sicilia, il Consorzio Madonita per la Legalità e lo Sviluppo e il CRESM - Centro di Ricerche Economiche e Sociali per il Meridione, ha l'obiettivo di trasformare i 150 ettari di terreno confiscato in una risorsa fertile e produttiva. Questo progetto rappresenta un atto di speranza per l'intera comunità locale e non solo: coinvolge un'ampia rete di associazioni e cooperative, che insieme condividono l'impegno per la legalità, lo sviluppo sostenibile e la creazione di opportunità lavorative dignitose.

Verbumcaudo, un tempo simbolo del potere mafioso, è ora l'emblema di una nuova Sicilia, capace di rispondere alle sfide del presente attraverso il coraggio e la solidarietà. La rinascita di questi terreni agricoli, un tempo incolti e dimenticati, diventa il fulcro di un modello di sviluppo rurale che punta a valorizzare le risorse naturali del territorio, a promuovere l'agricoltura biologica e a creare opportunità di lavoro in sintonia con l'ambiente e la legalità. Il lavoro instancabile della cooperativa e il sostegno delle istituzioni locali e delle realtà associative fanno sì che Verbumcaudo sia un faro di speranza, non solo per i suoi membri, ma per tutti coloro che credono in una Sicilia libera dalla mafia e impegnata a costruire un futuro di sviluppo e giustizia sociale.

Cooperative di comunità

Nel cuore della Sicilia, tra l'area del Vallone nisseno e le Madonie, si erge un simbolo di rinascita e speranza: una masseria e campi coltivati in biologico che un tempo erano sotto il controllo dei fratelli Greco, noti boss della famiglia di Ciaculli fino al 1983. Oggi, questi terreni sono stati riscattati dalla comunità grazie all'impegno di undici giovani coraggiosi che hanno dato vita alla Cooperativa Sociale Verbumcaudo.

Le storie dei membri della cooperativa raccontano di giovani determinati, impegnati nell'entroterra siciliano con professioni variegate come ingegneri, geologi, guide naturalistiche, agronomi e commercialisti specializzati nelle lavorazioni agricole. Verbumcaudo non è solo un'impresa agricola, ma un simbolo di resilienza e di riscatto per una generazione che ha scelto di investire nel proprio territorio e di lottare per un futuro dignitoso.

A questa iniziativa si affiancano altri progetti di valorizzazione del territorio madonita. Tra questi, la "Valorizzazione museale e culturale del territorio di Petralia Sottana e delle Madonie" proposto da Giulia Giordano, il progetto "Madonie Bike Trials" di Diego Maria Geraci e "Valledolmo ieri e oggi" di Antonio Barone. Questi progetti testimoniano un impegno diffuso nel costruire un futuro migliore, coltivando la comunità e seminando speranza per tutti.

Linee Guida

- **incontri di consultazione:** Organizzare incontri regolari con i rappresentanti dei comuni esclusi per discutere delle opportunità offerte dal progetto Verbumcaudo, dei benefici previsti e dei modi per collaborare in modo sinergico.
- **partenariati locali:** Favorire la creazione di partenariati locali con le amministrazioni dei comuni esclusi. Questo può includere la condivisione di risorse, competenze e conoscenze per massimizzare l'impatto positivo del progetto sull'intera regione.
- **adattamento alle specificità locali:** Personalizzare le iniziative del progetto per rispondere alle specificità e alle esigenze dei comuni esclusi. Questo può implicare l'implementazione di soluzioni flessibili che tengano conto delle risorse locali e delle priorità delle comunità coinvolte.
- **formazione e capacitazione:** Offrire formazione e supporto tecnico ai rappresentanti dei comuni esclusi per migliorare le loro capacità di gestione e di partecipazione attiva al progetto. Ciò può contribuire a garantire un coinvolgimento efficace e una comprensione approfondita dei benefici derivanti dal progetto.
- **comunicazione chiara e accessibile:** Utilizzare canali di comunicazione chiari e accessibili per informare i comuni esclusi sui progressi del progetto, sui risultati ottenuti e sulle opportunità future di collaborazione. Questo aiuta a mantenere un dialogo aperto e trasparente tra tutte le parti coinvolte.
- **monitoraggio e valutazione condivisi:** Implementare un sistema di monitoraggio e valutazione condiviso che includa indicatori specifici per misurare l'impatto del progetto nei comuni esclusi. Questo permette di identificare i successi raggiunti e le aree in cui è necessario migliorare.
- **riconoscimento dei contributi locali:** Valorizzare e riconoscere il contributo dei comuni esclusi nel successo del progetto Verbumcaudo. Questo può essere fatto attraverso la pubblicizzazione dei risultati ottenuti e la celebrazione delle collaborazioni positive.

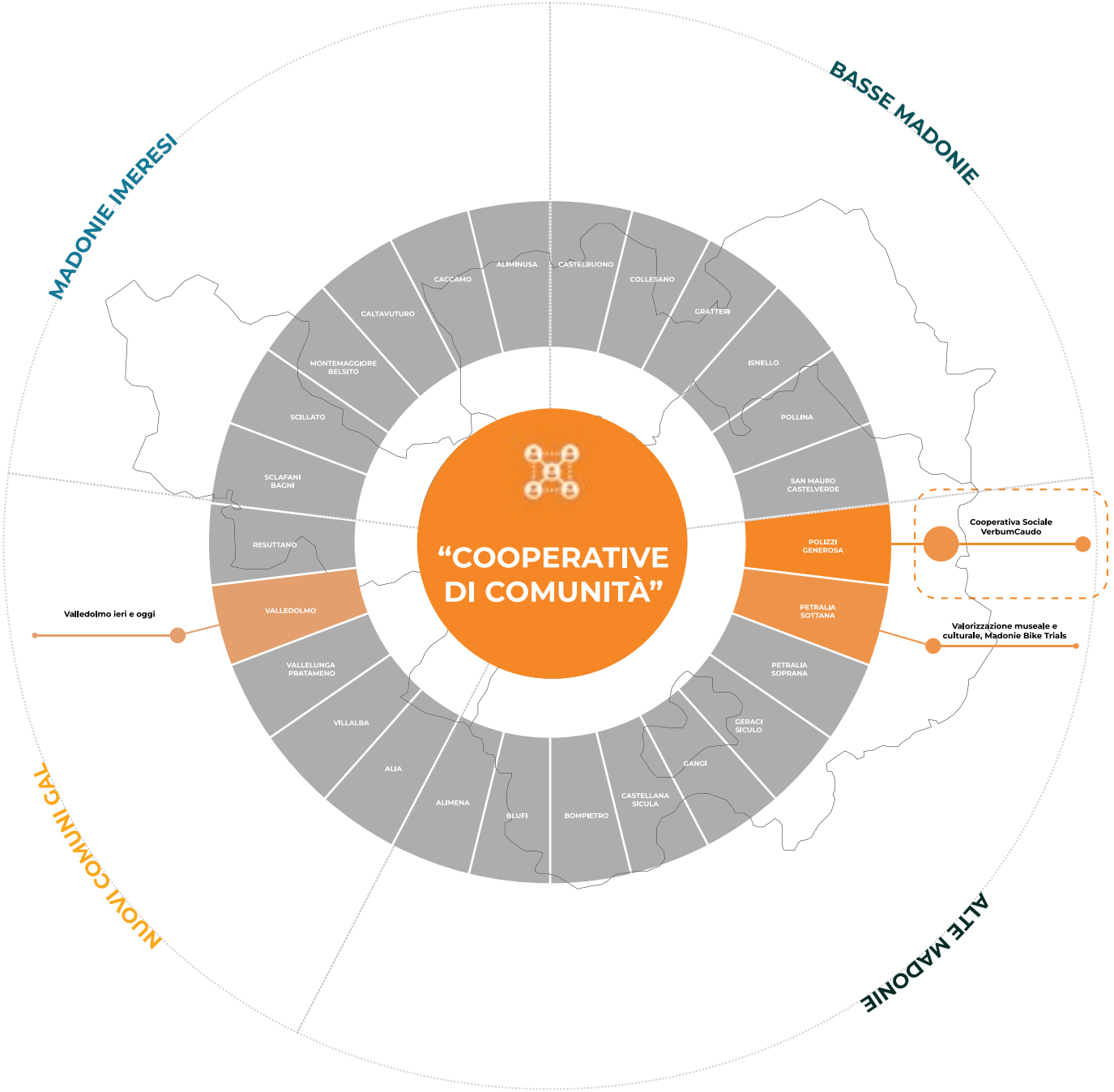
Benefici del principio di inclusività

L'inclusività nel progetto Verbumcaudo porta con sé una vasta gamma di benefici tangibili e intangibili che si estendono a tutti i soggetti coinvolti, compresi i comuni inizialmente esclusi dalle principali dinamiche decisionali. In primo luogo, essa promuove un forte senso di appartenenza e partecipazione attiva, soprattutto tra quei comuni che, fino ad ora, si erano sentiti marginalizzati o meno considerati. Il loro coinvolgimento diretto nelle fasi di progettazione e implementazione delle iniziative consente non solo di farli sentire parte integrante del processo, ma anche di rafforzare il legame di fiducia e collaborazione con la cooperativa e le altre comunità circostanti. Questo crea un ambiente favorevole, basato sulla cooperazione reciproca e sulla condivisione di obiettivi comuni. Dal punto di vista sociale, l'inclusività è fondamentale per stimolare il dialogo e l'integrazione tra le diverse realtà locali, contribuendo alla creazione di una comunità più coesa e armoniosa. Favorisce l'emergere di nuove prospettive, idee e approcci che arricchiscono il tessuto sociale delle Madonie. Ogni comunità porta con sé un bagaglio unico di esperienze e tradizioni, che può essere utilizzato come risorsa preziosa per stimolare l'innovazione e la creatività all'interno del progetto Verbumcaudo. Questa varietà di competenze, conoscenze e visioni del mondo arricchisce le discussioni, permettendo di trovare soluzioni più efficaci e meglio adattate alle esigenze specifiche del territorio. In questo modo, le iniziative progettuali non solo risultano più pertinenti, ma hanno anche una maggiore probabilità di successo e di impatto positivo nel lungo periodo.

Oltre agli aspetti sociali, l'inclusività svolge un ruolo cruciale anche dal punto di vista economico. In contesti come quello siciliano, spesso caratterizzati da disparità socio-economiche, garantire la partecipazione attiva di tutti i comuni, inclusi quelli più

piccoli o marginali, rappresenta una strategia efficace per ridurre le disuguaglianze e promuovere una distribuzione più equa delle risorse. Coinvolgere attivamente i comuni precedentemente esclusi permette di sfruttare al meglio le risorse locali, sia umane che materiali, creando sinergie che migliorano l'efficienza complessiva delle iniziative. Questo approccio non solo massimizza i benefici a breve termine, ma contribuisce a costruire le basi per una crescita economica più equa e sostenibile nel lungo periodo. In particolare, in un contesto come quello delle Madonie, dove le dinamiche sociali e storiche influenzano profondamente la coesione e il benessere delle comunità, l'inclusività assume una dimensione ancora più rilevante. Essa diventa uno strumento per promuovere l'equità e la giustizia sociale, garantendo che ogni individuo, indipendentemente dalla propria posizione geografica o dalle proprie condizioni economiche, abbia l'opportunità di partecipare e beneficiare delle iniziative promosse dal progetto Verbumcaudo. Questo si traduce in una maggiore coesione sociale, con un tessuto comunitario più unito e solidale.Infine, l'inclusività non deve essere vista solo come una scelta etica o morale, ma anche come una strategia di sostenibilità economica e sociale a lungo termine. Coinvolgendo tutti i comuni in modo attivo e collaborativo, si garantisce una maggiore resilienza delle iniziative, in grado di adattarsi meglio ai cambiamenti e alle sfide future.

COMUNI CONVOLTI	
ALTE MADONIE	2/9
BASSE MADONIE	1/6
MADONIE IMERESI	0/6
	2/21
COLLABORAZIONE	1/26
% COMUNI COINVOLTI	**15,38%**



Nonostante questi punti critici, le comunità energetiche rappresentano un investimento cruciale per la sostenibilità, l'efficienza e la resilienza del sistema energetico. Con il continuo sviluppo di tecnologie innovative, la riduzione dei costi e l'aumento della consapevolezza, le comunità energetiche diventeranno sempre più centrali nella trasformazione e nella gestione delle reti energetiche locali.

FATTORI TRAINANTI

Miglioramento della qualità della vita: Le comunità energetiche possono migliorare la qualità della vita fornendo accesso a energia pulita e sostenibile. Questo non solo riduce l'inquinamento atmosferico e i costi energetici per i residenti, ma crea anche ambienti più salubri e confortevoli.

Incremento della produttività: Un'infrastruttura energetica efficiente e affidabile nelle comunità energetiche supporta attività economiche più stabili e produttive. Minimizzare le interruzioni di corrente e ottimizzare l'uso dell'energia può aumentare la produttività delle imprese e delle industrie locali oltre a garantire un confort abitativo di elevati standard qualitativi.

Miglioramento dell'apprendimento: Le scuole e le istituzioni educative all'interno delle comunità energetiche possono beneficiare di soluzioni energetiche sostenibili. Questo non solo riduce i costi operativi delle istituzioni, ma fornisce anche un ambiente di apprendimento più sicuro e confortevole per gli studenti.

Tutela della salute: L'adozione di tecnologie energetiche pulite riduce le emissioni nocive e migliora la qualità dell'aria locale. Ciò contribuisce a mitigare i rischi per la salute associati all'inquinamento atmosferico, beneficiando direttamente i residenti delle comunità energetiche.

Aumento del valore immobiliare: Le proprietà all'interno delle comunità energetiche che integrano soluzioni energetiche sostenibili e efficienti possono vedere un aumento del valore immobiliare. Questo è dovuto alla crescente domanda di case e edifici che offrono minori costi energetici e un impatto ambientale ridotto.

PUNTI CRITICI

Costi elevati: L'implementazione di soluzioni energetiche sostenibili può essere costosa, specialmente per le comunità energetiche che devono affrontare la transizione da fonti tradizionali a fonti rinnovabili. Investimenti in tecnologie come pannelli solari, sistemi di accumulo energetico o reti intelligenti possono inizialmente richiedere risorse significative.

Difficoltà tecniche: La transizione verso una comunità energetica può implicare interventi tecnici complessi come l'integrazione di reti di distribuzione energetica intelligente o la retrofitting di edifici esistenti con tecnologie avanzate. Questi interventi possono essere invasivi e richiedere competenze specializzate per essere implementati correttamente.

Mancanza di consapevolezza: Non tutti i membri della comunità possono essere consapevoli delle opportunità offerte dalle tecnologie energetiche sostenibili e dei benefici che possono portare in termini di risparmio energetico e riduzione delle emissioni. Educare la comunità e promuovere la consapevolezza può essere cruciale per ottenere un'adozione diffusa di soluzioni energetiche sostenibili.

Barriere normative: Regolamenti rigidi o standard di conformità possono limitare la flessibilità nella progettazione e nell'implementazione di infrastrutture energetiche avanzate.

Mancanza di incentivi: Senza incentivi adeguati, il ritorno sull'investimento potrebbe non essere sufficiente per giustificare l'adozione di tecnologie energetiche innovative.

VALUTAZIONE DEI CRITERI SMART PER APPROCCI DI GOVERNANCE

Petralia Soprana; ©Quelli del Parco delle Madonie, 2023

Nel contesto della discussione sui "smart village", un concetto in espansione che riflette la trasformazione delle comunità rurali in spazi più moderni, connessi e sostenibili, è essenziale considerare la figura della "smart governance".

Quest'ultima rappresenta l'approccio di un governo che abbraccia una visione strategica per lo sviluppo del proprio territorio, con l'obiettivo primario di adottare linee di azione capaci di coinvolgere attivamente i cittadini nei temi di rilevanza pubblica, promuovendo azioni di sensibilizzazione e sfruttando le tecnologie per digitalizzare e abbreviare le procedure amministrative.

La "smart governance" si colloca all'incrocio tra innovazione tecnologica, amministrazione pubblica e coinvolgimento dei cittadini, promuovendo un governo aperto e partecipativo. Questo approccio, con il sostegno delle moderne infrastrutture tecnologiche, si propone di rivoluzionare l'erogazione dei servizi pubblici e l'attivazione di modelli di partecipazione attiva da parte dei cittadini. Tra le iniziative chiave di questa forma di governance, emergono le seguenti:

1. **servizi digitali accessibili:** in un'epoca in cui la connettività è pervasiva, la "smart governance" si impegna a rendere i servizi pubblici facilmente accessibili online. questo consente ai cittadini di effettuare transazioni e accedere alle informazioni in modo semplice e conveniente, riducendo la necessità di spostamenti fisici e semplificando la vita quotidiana.
2. **pagamenti elettronici:** la possibilità di effettuare pagamenti elettronici semplifica notevolmente le procedure di pagamento, rendendo i processi finanziari più efficienti e sicuri. ciò riduce l'uso del contante e promuove un sistema di pagamento più trasparente.
3. **open data per la trasparenza amministrativa:** la condivisione di dati pubblici in formato aperto (open data) permette ai cittadini e agli sviluppatori di accedere a una vasta gamma di informazioni. questo contribuisce a promuovere la trasparenza amministrativa e la responsabilità, permettendo una migliore comprensione delle attività governative e la partecipazione informata dei cittadini.
4. **strumenti online per l'interazione con la pubblica amministrazione:** le tecnologie consentono ai cittadini di comunicare con la pubblica amministrazione in modo rapido ed efficiente. i servizi di assistenza online, i moduli elettronici e le chatbot sono solo alcuni esempi di strumenti che semplificano le interazioni e migliorano l'esperienza del cittadino.

La "smart governance" mira a trasformare la pubblica amministrazione in un'entità reattiva, efficiente e incentrata sul cittadino.

Questo approccio è particolarmente rilevante per gli "smart village", in quanto contribuisce all'innovazione e al progresso delle comunità rurali, consentendo loro di sfruttare appieno le opportunità offerte dalla digitalizzazione e di partecipare attivamente alla costruzione del proprio futuro.

La combinazione di infrastrutture tecnologiche avanzate e un impegno tangibile verso una governance intelligente è fondamentale per realizzare il pieno potenziale delle aree rurali, come quelle dell'entroterra siciliano nel Parco delle Madonie.

Ecco alcuni esempi di successo di smart governance applicati in altri contesti e riproducibili nel contesto madonita:

Paesaggio madonita;
©Salvatore Di Venuto, 2023

1. Piattaforma telematica per pratiche online

Implementare uno sportello virtuale per le pubbliche amministrazioni è di fondamentale importanza per diverse ragioni.

Innanzitutto, nel contesto attuale, è impensabile non considerare il web come uno strumento rapido e conveniente per il cittadino.

Uno sportello virtuale, che generalmente richiede la registrazione o l'autenticazione dell'utente tramite strumenti come la firma digitale, SPID, CIE o la carta nazionale dei servizi, consente di ottenere o consegnare documenti e pagare servizi comunali e sanzioni senza la necessità di recarsi fisicamente presso gli uffici della pubblica amministrazione.

Per evitare il rischio di disorientamento del cittadino-utente, l'operatore dello sportello può utilizzare strumenti di supporto e affiancamento per guidare l'utente nell'espletamento delle pratiche o dei servizi richiesti, sempre durante il collegamento.

Un ulteriore punto di forza degli sportelli virtuali è la possibilità di garantire la continuità operativa anche in caso di sospensione delle attività in presenza dovuta a situazioni straordinarie, come l'emergenza Covid-19, o per consentire agli operatori di lavorare in modalità agile.

Il cittadino può inoltre ridurre sensibilmente i tempi di attesa e richiedere i servizi desiderati senza vincoli di orario o luogo. Questo abbattimento dei tempi di attesa rappresenta un beneficio anche per le amministrazioni pubbliche, che possono così ridurre i costi e, al contempo, salvaguardare la qualità del servizio offerto.

2. Social Housing

Proporre un nuovo modello abitativo inclusivo e sostenibile si basa su quattro pilastri fondamentali: ambiente, architettura, tecnologia e comunità.

Questo modello prevede la rifunzionalizzazione dell'edilizia in disuso per ospitare appartamenti in locazione e vendita convenzionata di diverse dimensioni e tipologie, oltre ad ampi spazi comuni nei piani inferiori.

Tra i servizi abitativi essenziali, devono essere inclusi l'ufficio del gestore sociale, uno spazio living, una sala polivalente e una palestra. Per quanto riguarda i servizi locali urbani, è necessario prevedere un poliambulatorio e un consultorio familiare. Inoltre, ampi spazi devono essere dedicati ad attività commerciali quali negozi, bar e aree ristoro.

È importante considerare anche la possibilità di convertire edifici in disuso come vecchi rifugi montani o carceri abbandonati nel Parco delle Madonie, adattandoli al nuovo modello abitativo. Questo permetterebbe non solo di recuperare strutture storiche, ma anche di integrarle in un contesto di sostenibilità e inclusività, favorendo la creazione di comunità più coese e resilienti.

3. Case di Cura

Un innovativo modello abitativo inclusivo e sostenibile potrebbe consistere nell'istituire case di cura destinate a fornire assistenza alla popolazione anziana dei territori, garantendo un'assistenza sanitaria continua.

Questo è particolarmente importante considerando la distanza da strutture sanitarie come gli ospedali e le difficoltà legate alla mobilità all'interno dei centri storici delle Madonie.

Queste case di cura potrebbero essere ospitate in edifici dismessi, come vecchi rifugi di montagna o fabbricati rurali, nonché in immobili non utilizzati nel centro storico, sia di proprietà privata che comunale. L'obiettivo sarebbe quello di fornire un ambiente sicuro e confortevole dove gli anziani possano ricevere le cure necessarie senza dover affrontare lunghi viaggi verso strutture sanitarie distanti.

Potrebbero essere progettate per garantire un'assistenza personalizzata e di qualità, prendendo in considerazione le esigenze specifiche della popolazione anziana e offrendo servizi adeguati per il loro benessere fisico e psicologico. Tale modello abitativo inclusivo e sostenibile mirerebbe non solo a migliorare la qualità della vita degli anziani, ma anche a valorizzare e recuperare edifici storici e in disuso, integrandoli in un contesto di assistenza e cura.

4. Musei diffusi

Nel ricco panorama culturale del Parco delle Madonie, i musei e gli spazi espositivi civici rivestono un ruolo di particolare rilevanza, custodendo opere di pittura, scultura, grafica e oggetti d'arte e naturalistici all'interno di edifici di grande valore storico e artistico.

Gli ecomusei, noti anche come musei diffusi, rappresentano un approccio partecipativo al riconoscimento, alla cura e alla gestione del patrimonio culturale locale, con l'obiettivo di promuovere uno sviluppo sociale, ambientale ed economico sostenibile. Questi si configurano come identità progettuali che mettono in relazione usi, tecniche, colture, produzioni e risorse di un territorio con i beni culturali che lo caratterizzano.

Fungono da veicoli di crescita culturale per le comunità locali, promuovendo la partecipazione attiva degli abitanti e la collaborazione tra enti e associazioni. Sono definiti anche come musei di comunità o musei locali, sviluppando strategie territoriali e coinvolgendo la popolazione nella valorizzazione e fruizione del patrimonio culturale. Sono concepiti per far emergere l'identità e la vocazione del territorio, proponendo un approccio innovativo rispetto al tradizionale museo. Originariamente ideati come strumenti di tutela delle società rurali e del patrimonio culturale locale, si sono evoluti in importanti strumenti di conservazione e promozione della memoria storica e delle tradizioni.

L'Ecomuseo delle Madonie, potrebbe fungere da aggregatore per i 21 comuni del territorio, creando una rete collaborativa e offrendo una cultura diffusa su tutto il territorio. Questo approccio consentirebbe una maggiore collaborazione e una valorizzazione del patrimonio locale.

5. Alberghi diffusi

L'albergo diffuso offre un'esperienza unica di immersione nella vita di un borgo, consentendo agli ospiti di sentirsi parte integrante della comunità locale. Questo innovativo modello turistico si basa sull'inserimento delle strutture ricettive all'interno del tessuto abitativo del centro storico, rivitalizzando così piccoli borghi rurali e contribuendo a preservarne il patrimonio culturale e ambientale.

L'albergo diffuso opera attraverso la distribuzione degli alloggi in diverse strutture sparse per il centro cittadino, offrendo agli ospiti tutti i comfort tipici degli alberghi ma con un'atmosfera unica e autentica. Gli edifici, spesso antichi e di pregio, vengono ristrutturati nel pieno rispetto della loro identità storica e ambientale, garantendo un basso impatto sull'ambiente grazie al recupero e al riutilizzo delle strutture esistenti, senza la necessità di costruire ex novo. Il modello favorisce una forma di turismo sostenibile e responsabile, contribuendo al mantenimento delle tradizioni locali e al rilancio delle economie rurali. Le strutture sono caratterizzate da una gestione "orizzontale", con una reception e una sala colazioni centralizzate, che promuovono un approccio più intimo e autentico all'ospitalità.

Per realizzare un progetto di albergo diffuso, è fondamentale individuare un paese con un forte interesse storico-ambientale e parzialmente disabitato, identificare gli edifici adatti ad accogliere gli ospiti e procedere alla ristrutturazione nel pieno rispetto della natura e dell'identità del luogo. Inoltre, l'albergo diffuso favorisce la creazione di legami umani autentici e genuini, consentendo agli ospiti di vivere un'esperienza unica di contatto diretto con la comunità locale e di scoprire il territorio in modo autentico e profondo.

6. Laboratori alpini

I laboratori alpini rappresentano un'esperienza coinvolgente aperta a una vasta gamma di partecipanti, che includono giovani studenti delle scuole elementari, medie e superiori, operatori locali, associazioni e cittadini.

Questa iniziativa si svolge in un territorio in continua trasformazione, dove l'ambiente urbano si fonde con quello montano, creando un vero e proprio laboratorio di sperimentazione per nuove metodologie di indagine e dialogo con la comunità.

Attraverso il confronto e lo scambio di idee e visioni, spesso divergenti, emergono pratiche innovative e forme spontanee di imprenditorialità, sfidando i tradizionali stereotipi legati alla montagna.

Questo processo non solo favorisce la creazione di nuove opportunità imprenditoriali, ma anche l'elaborazione di nuove prospettive e politiche per la valorizzazione e lo sviluppo della valle. Le attività proposte nei laboratori alpini mirano a riscoprire la montagna, a riviverla e a promuoverla come luogo ideale per lo svolgimento di attività che spesso non possono essere realizzate in ambiente urbano.

Queste attività includono esperienze legate alla natura, all'avventura, allo sport all'aria aperta, alla cultura locale e alla valorizzazione delle risorse naturali.

Attraverso queste attività, i partecipanti hanno l'opportunità di riscoprire e riconnettersi con l'ambiente montano, apprezzandone le peculiarità e le risorse uniche. Inoltre, i laboratori alpini favoriscono la costruzione di legami sociali e comunitari più forti, promuovendo un senso di appartenenza e di responsabilità verso il territorio e le sue risorse.

7. Case di racconti

Le Case dei Racconti costituiscono un'opportunità preziosa per coinvolgere gli anziani della comunità in attività diurne e/o pomeridiane finalizzate alla condivisione di racconti, storie antiche e tradizioni tramandate nel corso del tempo. Queste iniziative mirano a rivivere e preservare la storia e il patrimonio culturale di un luogo, consentendo alle nuove generazioni di apprezzare e comprendere appieno le radici e l'identità della propria comunità.

Attraverso la partecipazione attiva degli anziani, che rappresentano una fonte preziosa di conoscenze e esperienze, offrono un'occasione unica per conservare e trasmettere il ricco bagaglio culturale e storico delle generazioni passate. In questo modo, gli anziani possono sentirsi ancora parte integrante e fondamentale della comunità, contribuendo attivamente alla sua continuità e alla sua identità.

Le attività svolte vanno oltre la mera condivisione di storie e tradizioni: fungono da ponte intergenerazionale, favorendo lo scambio reciproco di conoscenze e esperienze tra anziani e giovan, questo non solo rafforza il senso di appartenenza e coesione sociale all'interno della comunità, ma contribuisce anche a promuovere la comprensione e il rispetto reciproco tra le diverse fasce d'età.

Inoltre, le Case dei Racconti rappresentano un mezzo efficace per preservare la memoria storica e culturale del territorio, salvaguardando tradizioni che altrimenti rischierebbero di andare perdute nel tempo. Grazie alla partecipazione attiva degli anziani, questi luoghi diventano autentici serbatoi di conoscenza, custodi di un patrimonio immateriale da valorizzare e tramandare alle generazioni future.

8. Case dei semi e delle tradizioni agricole

I piccoli laboratori volti alla promozione delle antiche sementi autoctone e dei prodotti slow food rappresentano un importante contributo alla valorizzazione delle risorse territoriali della regione madonita. La Casa dei Semi e delle Tradizioni Agricole costituisce una rete informale, autogestita e autofinanziata, che si interconnette con numerose associazioni, comitati e altre reti informali impegnate nella salvaguardia della biodiversità. Gli obiettivi di questa iniziativa, attraverso l'attuazione di pratiche di partecipazione diretta, autogestita e orizzontale, sono molteplici:

Promuovere un percorso di autodeterminazione alimentare, incoraggiando pratiche agroecologiche che pongano l'accento sulla sostenibilità e non esclusivamente sul profitto economico.

Rivalutare il ruolo cruciale dell'agricoltura, riaffermando il concetto che l'atto del mangiare è strettamente connesso alle pratiche agricole.

Restituire agli agricoltori le conoscenze e le competenze necessarie per la riproduzione, selezione e conservazione delle varietà locali di sementi.

Esplorare alternative forme di socialità basate su principi orizzontali, promuovendo pratiche che riaffermino l'autonomia individuale, comunitaria e territoriale.

Contrastare l'erosione della biodiversità attraverso la diffusione della pratica dello scambio di semi autoprodotti, favorendo un processo di selezione genetica partecipativa che risponda alle specifiche esigenze locali, anziché essere imposto da grandi multinazionali distanti dai contesti locali.

9. Eco e Bio Hotels

Per coloro che desiderano adottare uno stile di vita sostenibile non solo nella quotidianità, ma anche durante le vacanze, la scelta di un hotel o di altre strutture ricettive eco o bio sta diventando sempre più diffusa, rappresentando un'opzione ideale per praticare un turismo responsabile.

Gli eco hotel e le strutture ricettive sostenibili si distinguono per l'attenzione particolare rivolta all'ambiente, concentrandosi non solo sulla qualità dell'alimentazione, spesso basata su prodotti biologici e a filiera corta, ma anche sull'implementazione di pratiche e tecnologie volte a ridurre al minimo l'impatto sull'ecosistema circostante.

Tra le caratteristiche principali di queste strutture ricettive vi sono l'utilizzo di materiali eco-compatibili, la riduzione del consumo di acqua, l'adozione di misure per il risparmio energetico e l'installazione di sistemi di illuminazione ad alta efficienza energetica. Inoltre, viene promossa attivamente la raccolta differenziata dei rifiuti al fine di minimizzare l'impatto ambientale complessivo.

10. Pasticcerie dinamiche sostenibili

Le pasticcerie dinamiche sostenibili si distinguono per l'approccio innovativo e attento all'ambiente nella loro architettura, nelle fonti di energia utilizzate e soprattutto nella gestione della produzione. Queste pasticcerie spesso sfruttano container usati e riqualificati per la realizzazione degli spazi, riducendo così l'impatto ambientale legato alla costruzione di nuove strutture.

Un punto focale di queste pasticcerie è l'attenzione alla produzione e alla riduzione degli sprechi. Si cerca di combattere lo spreco adottando ricette che privilegiano materie prime locali e a chilometro zero, riducendo così il trasporto e l'impatto ambientale associato. I processi di lavorazione sono ottimizzati per ridurre al minimo gli sprechi di materie prime, risorse umane ed energia, riportando l'intero processo a un approccio artigianale che valorizza la qualità e la sostenibilità.

Un altro aspetto fondamentale è l'integrazione del concetto di economia circolare. Ciò implica non solo la riduzione degli sprechi, ma anche il riutilizzo e il riciclo dei materiali. Ad esempio, le pasticcerie dinamiche sostenibili possono eliminare l'uso di ingredienti non locali o non sostenibili, sostituendoli con prodotti della terra disponibili in abbondanza. Inoltre, si cerca di integrare gli scarti di altre produzioni, come agrumi o altri frutti, per creare nuovi prodotti e ridurre l'impatto ambientale complessivo.

Queste pasticcerie mirano a essere non solo luoghi di eccellenza gastronomica, ma anche modelli di sostenibilità ambientale ed economica, contribuendo così a promuovere uno stile di vita più responsabile e rispettoso dell'ambiente.

11. Borgo del benessere

La pratica del Borgo del Benessere si propone di creare comunità che vivano in armonia con la natura, rispettando sia l'essere umano che l'ambiente circostante, e investendo per garantire il benessere delle generazioni future. Il suo scopo è restituire al borgo calabrese, e successivamente a livello nazionale ed europeo, la propria identità, recuperando la storia, le tradizioni, la cultura, la produzione, il paesaggio, le bellezze architettoniche e urbanistiche, nonché la biodiversità. L'obiettivo è valorizzare una "cultura del benessere" che renda ogni individuo protagonista della propria qualità di vita, libero nelle proprie scelte ma al contempo responsabile delle conseguenze che queste comportano sulla salute, sulla vita e sulla società.

Il Borgo del Benessere mira a promuovere una nuova cultura fondata su scelte orientate verso comportamenti salutari e rispettosi, sensibilizzando alla tutela di sé stessi e degli altri. Questi obiettivi possono essere raggiunti solo attraverso una convergenza di valori che includono la pianificazione e la promozione di uno sviluppo ecosostenibile, la diffusione della consapevolezza del patrimonio culturale delle diverse civiltà e l'apprezzamento dei valori intrinseci delle diverse culture, contribuendo così alla pace nel mondo.

L'obiettivo finale è creare un marchio distintivo che identifichi luoghi in cui il valore della salute, del benessere e della qualità della vita sia effettivamente prioritario. Inoltre, si valuta la possibilità di creare alberghi diffusi dedicati al benessere e alla terza età, nonché sistemi di accoglienza per il turismo parasanitario. Si promuovono anche servizi culturali che valorizzano le componenti naturalistiche, ambientali e culturali del territorio.

12. Case a "1□"

Il progetto delle Case a 1 euro è stato avviato in alcuni comuni italiani con l'obiettivo di contrastare il fenomeno dell'abbandono e rivitalizzare le aree in difficoltà. Attraverso questa iniziativa, si intende ripopolare borghi affascinanti ma in via di spopolamento, una conseguenza diretta dell'emigrazione dei giovani e del declino demografico della popolazione anziana.

Il programma mira a incentivare la rinascita di questi piccoli centri storici offrendo un'opportunità unica per l'acquisizione di proprietà immobiliari a costi simbolici. Questa strategia non solo constrasta il degrado urbano, ma potrebbe anche avere un impatto significativo sul mercato immobiliare locale, facilitando l'accesso alla proprietà per i giovani. Spesso, infatti, i giovani si trovano ad affrontare notevoli difficoltà nel reperire finanziamenti adeguati per l'acquisto di una casa. La disponibilità di immobili a prezzi simbolici potrebbe quindi rappresentare una soluzione concreta per superare tali ostacoli.

Il progetto delle Case a 1 euro ha il potenziale di stimolare lo sviluppo economico delle aree interessate. La ripopolazione di questi borghi può favorire la creazione di nuove attività turistiche e commerciali, generando un circolo virtuoso di crescita economica e sociale. L'aumento della popolazione residente, infatti, contribuisce a creare un ambiente più vivace e dinamico, attirando ulteriori investimenti e favorendo la creazione di nuovi posti di lavoro.

Nell'ottica di valorizzare ulteriormente l'accoglienza turistica, si potrebbe considerare la ristrutturazione degli immobili acquistati per trasformarli in strutture ricettive come piccoli hotel, bed and breakfast, o adottare progetti più ampi come gli alberghi diffusi.

13. Wonderful Italy

Per valorizzare il territorio delle Madonie come una destinazione culturale accattivante e inclusiva, è stato concepito il progetto "Wonderful Italy". Questa iniziativa mira a creare un sistema di ospitalità diffusa nell'area, offrendo opportunità sia agli imprenditori locali – come artigiani, fornitori di servizi, commercianti, ristoratori e professionisti – sia agli operatori culturali e turistici.

Il progetto "Wonderful Italy" promuove la collaborazione tra diversi attori locali per sviluppare modelli di aggregazione e sfruttare appieno il patrimonio immobiliare della zona. L'obiettivo è creare un ambiente inclusivo e dinamico, dove sia gli abitanti del territorio sia i visitatori possano godere di un'esperienza culturale unica e autentica.

L'iniziativa integra le attività economiche locali con il turismo sostenibile, stimolando l'economia locale e preservando il patrimonio culturale e naturale delle Madonie. La creazione di una rete di ospitalità diffusa offre soluzioni di alloggio autentiche, permettendo ai visitatori di immergersi nella vita del borgo e di interagire con la comunità locale.

"Wonderful Italy" favorisce la partecipazione attiva degli imprenditori locali, incentivandoli a collaborare per offrire servizi di alta qualità e esperienze personalizzate ai turisti. Il progetto promuove modelli di sviluppo sostenibile, rispettosi dell'ambiente e della cultura locale, contribuendo a preservare la bellezza e l'integrità del paesaggio delle Madonie.

Un'iniziativa che mira a trasformare le Madonie in una destinazione culturale di rilievo, valorizzando le risorse locali e promuovendo la collaborazione tra gli attori del territorio.

14. Presidi emergenziali

La promozione degli immobili situati nelle aree intercomunali, specialmente in quelle zone rurali isolate, mira al loro potenziale riutilizzo come presidi sanitari temporanei.

Questo approccio consente di garantire assistenza medica temporanea in situazioni di emergenza, soprattutto nelle aree prive di infrastrutture sanitarie consolidate o di copertura telefonica o Wi-Fi.

Gli immobili riadattati potrebbero offrire la possibilità di accesso a farmaci per una gestione autonoma delle emergenze sanitarie di breve durata.

Questi presidi se dotati di servizi essenziali possono garantire un'assistenza efficace, inclusi la disponibilità di chiamate di emergenza, connessione Wi-Fi e accesso alla rete telefonica.

Gli alloggi sono assegnati attraverso codici temporanei che consentono l'accesso e l'utilizzo dei servizi disponibili. Potrebbero essere, inoltre, forniti generi alimentari per il sostentamento quotidiano, una libreria, una TV e mappe per la localizzazione e l'orientamento.

Gli immobili utilizzati come presidi possono essere sia proprietà private messe a disposizione, sia edifici comunali adattati a tale scopo. Questa iniziativa permette di massimizzare l'utilizzo delle risorse esistenti per garantire un supporto sanitario immediato nelle aree interne, contribuendo così alla sicurezza e al benessere delle comunità locali.

15. Cohousing per over 65

Il progetto di co-housing mira a creare un ambiente comunitario innovativo e inclusivo, rivolto agli adulti over 65, uomini e donne, che sono autosufficienti e desiderosi di vivere in un contesto sociale attivo e solidale. L'obiettivo primario è promuovere esperienze di convivenza che favoriscano la condivisione di risorse, lo sviluppo di legami interpersonali e la creazione di una rete di supporto reciproco.

La proposta si apre anche alla possibilità di convivenza tra persone di diverse fasce d'età, come anziani soli accanto a studenti fuorisede in cerca di alloggio per motivi di studio. Questo approccio intende favorire la diversità e l'intergenerazionalità all'interno della comunità. Offre un ambiente sicuro e accogliente, dove gli anziani possono godere di una vita attiva e socialmente arricchente. La struttura è progettata per garantire un equilibrio tra privacy e spazi comuni, consentendo agli abitanti di mantenere la propria autonomia e individualità all'interno della comunità.

Tra i principi fondamentali del co-housing vi è la partecipazione attiva degli abitanti alla progettazione e alla gestione della comunità. Questo processo collaborativo consente agli abitanti di influenzare direttamente le decisioni riguardanti servizi condivisi, regole di convivenza e gestione degli spazi comuni. La comunità di co-housing si basa su un modello non gerarchico, in cui le responsabilità sono distribuite equamente tra gli abitanti e le decisioni sono prese attraverso il consenso collettivo. Questo approccio favorisce la coesione sociale e la partecipazione attiva di tutti i membri della comunità.

L'aspetto finanziario è un altro elemento significativo del co-housing, poiché consente di ridurre i costi della vita attraverso la condivisione di beni

e servizi. Questo include la gestione collettiva delle spese, la riduzione degli sprechi e l'accesso a servizi a valore aggiunto a costi più convenienti.

In sintesi, il co-housing rappresenta un'opportunità unica per gli anziani autosufficienti di vivere in un ambiente comunitario accogliente e dinamico, dove possono condividere esperienze, risorse e affetti, mantenendo nel contempo la propria privacy e autonomia.

Alimena;
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16. Casa del parco

La Casa del Parco è concepita come un centro multifunzionale dedicato a offrire una vasta gamma di servizi e attività, sia all'interno che all'esterno della struttura, per soddisfare le esigenze di una clientela diversificata.

Per ottimizzare l'esperienza degli ospiti e valorizzare al massimo la struttura è opportuno che ci siano: Una cucina completamente attrezzata e una sala da pranzo accogliente saranno disponibili per ospitare i visitatori durante i pasti, offrendo un ambiente conviviale e funzionale. Le camere progettare con attenzione alla qualità del riposo e al benessere degli ospiti. Spazi tranquilli e ben arredati per il relax e la lettura permetteranno agli ospiti di godere di momenti di tranquillità e immersione nella lettura.

La struttura deve includere aree dedicate ai più piccoli, progettate per offrire sicurezza e intrattenimento ai bambini, assicurando una visita piacevole anche per le famiglie, così come spazi per attività educative e ricreative, con laboratori e workshop destinati ai visitatori di tutte le età, per stimolare l'apprendimento e la creatività. Offrire un'esperienza visiva e contemplativa unica come passeggiate, picnic e altre attività all'aperto, facilitando un contatto diretto con la bellezza naturale del territorio.

Questa proposta mira a trasformare la Casa del Parco in un luogo di incontro e di esperienza, accogliendo visitatori in un ambiente che combina comfort, funzionalità e immersione nella natura. Attraverso questi servizi e spazi dedicati, intendiamo creare un centro vivace e accogliente, capace di soddisfare le diverse esigenze dei nostri ospiti e di valorizzare l'intero contesto naturale e culturale in cui si inserisce.

17. Travel Designer

Il travel designer è un professionista specializzato nella creazione di viaggi personalizzati, vero e proprio architetto del viaggio. Possiede una conoscenza approfondita delle destinazioni turistiche e delle esperienze disponibili a livello globale. Il suo obiettivo è progettare viaggi che rispondano alle specifiche esigenze e preferenze di ciascun cliente.

Inizia il suo lavoro collaborando strettamente con il cliente per comprendere le sue preferenze, interessi e budget. Sulla base di queste informazioni, elabora un itinerario dettagliato che include le principali attrazioni, alloggi idonei e esperienze esclusive. Si occupa di tutti gli aspetti logistici del viaggio, come la prenotazione di voli, alloggi, trasferimenti e attività. Grazie alla sua vasta conoscenza delle destinazioni e delle esperienze locali, il travel designer ricerca attività speciali e autentiche che arricchiscano il viaggio, come escursioni, tour culturali e degustazioni gastronomiche. Fornisce supporto continuo durante il viaggio, inclusa assistenza 24 ore su 24, gestione degli imprevisti e aggiornamenti dell'itinerario in base alle esigenze emergenti del cliente. La figura del travel designer riveste un ruolo cruciale per i viaggiatori che desiderano un'esperienza su misura. Il travel designer possiede una conoscenza approfondita delle destinazioni turistiche e delle esperienze locali, offrendo al cliente una prospettiva esclusiva. Conosce le migliori strutture ricettive e le offerte speciali disponibili, assicurando al cliente alloggi di alta qualità e servizi aggiuntivi. Si occupa di tutti gli aspetti organizzativi del viaggio, risparmiando tempo e fatica al cliente, e fornisce un supporto costante e tempestivo, garantendo una risposta rapida e personalizzata alle esigenze del cliente durante tutto il viaggio.

Vendemmia di comunità; ©Verbumcaudo, 2023

AMA RIFIUTO E' RISORSA

AMA Rifiuto è Risorsa S.c.a r.l. è un consorzio dedicato alla gestione integrata dei servizi di igiene ambientale, con una struttura mutualistica e senza scopo di lucro. Questo consorzio è formato dagli enti soci delle Alte Madonie, che includono i comuni di Alia, Alimena, Blufi, Bompietro, Caltavuturo, Castellana Sicula, Gangi, Geraci Siculo, Petralia Soprana, Petralia Sottana, Polizzi Generosa, San Mauro Castelverde, Scillato, Sclafani Bagni, Valledolmo, e la S.R.R. Palermo Provincia Est S.C.P.A.

L'obiettivo principale dell'AMA Rifiuto è Risorsa è quello di creare un'organizzazione comune, come previsto dall'art. 2602 del Codice Civile, per ottimizzare le capacità tecniche, operative, amministrative, gestionali e finanziarie dei comuni consorziati. Questo approccio consente una gestione unitaria e integrata dei rifiuti solidi urbani, seguendo criteri di efficienza, efficacia ed economicità nell'area di raccolta ottimale (ARO).

Il consorzio opera in conformità con le direttive dell'Unione Europea e le normative nazionali e regionali vigenti in materia di gestione dei rifiuti, garantendo così un servizio che rispetta gli standard richiesti a livello europeo e nazionale.

Linee Guida

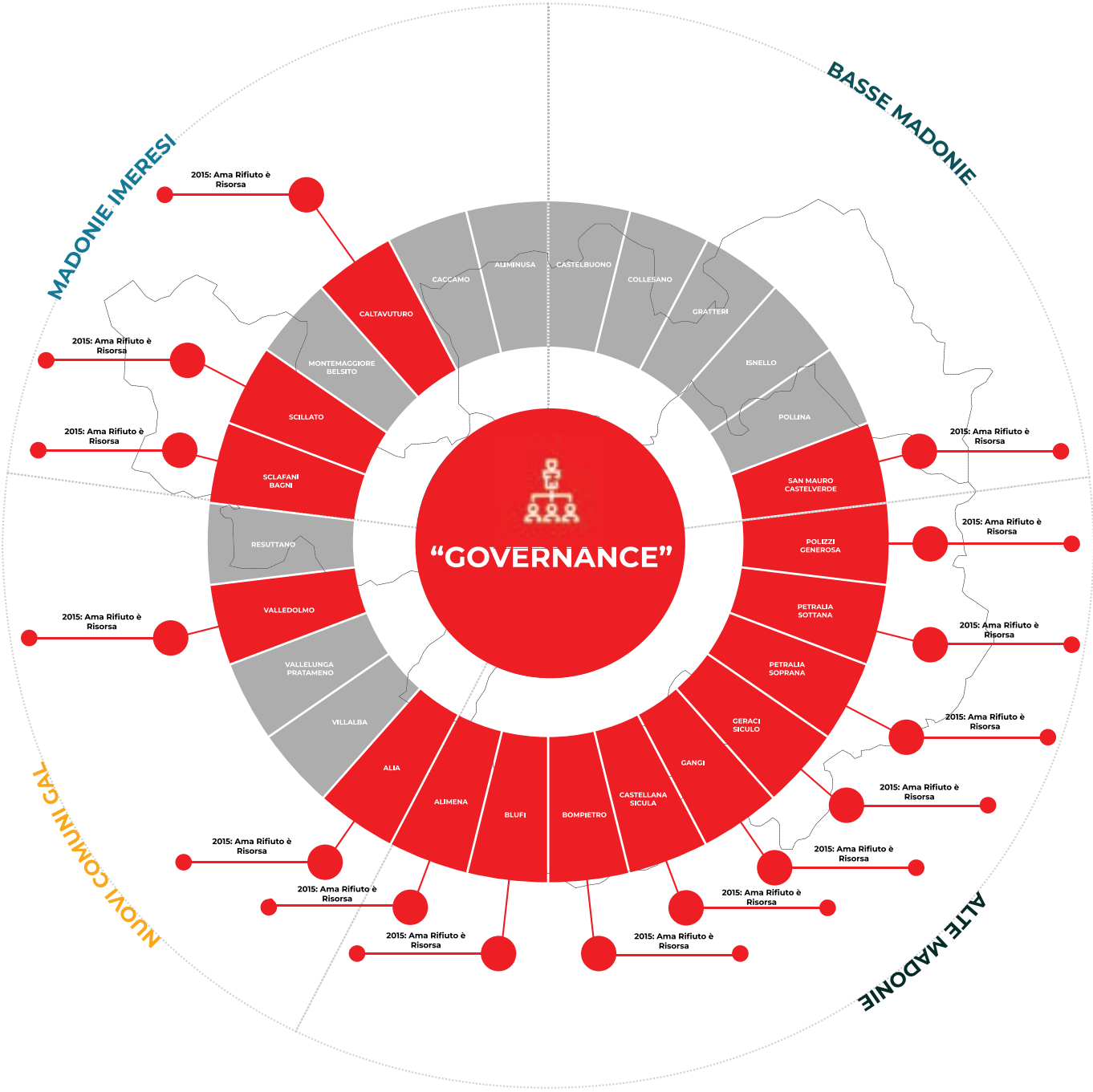
- **incontri informativi:** organizzare riunioni periodiche con i rappresentanti dei comuni esclusi per informarli sui benefici, sui risultati raggiunti e sulle future iniziative del consorzio. Report periodici: distribuire report trimestrali che evidenzino le performance e i miglioramenti ottenuti attraverso la gestione integrata dei rifiuti.
- **tavoli di lavoro congiunti:** creare gruppi di lavoro con rappresentanti dei comuni esclusi per discutere e sviluppare proposte su come migliorare la gestione dei rifiuti. partecipazione a progetti pilota: invitarli a partecipare a progetti pilota per mostrare i benefici tangibili della gestione consortile.
- **sostegno finanziario:** offrire incentivi economici o agevolazioni finanziarie ai comuni che decidono di aderire al consorzio. Contributi tecnici e operativi: fornire supporto tecnico e operativo iniziale per facilitare l'integrazione dei nuovi comuni nel sistema consortile.
- **corsi di formazione:** organizzare sessioni formative per gli amministratori e il personale dei comuni esclusi sui vantaggi e le modalità della gestione integrata dei rifiuti.
- **campagne di sensibilizzazione:** promuovere campagne informative per sensibilizzare la cittadinanza sui benefici ambientali ed economici derivanti dall'adesione al consorzio.
- **partnership strategiche:** stabilire collaborazioni con enti sovracomunali, come province o regioni, per promuovere l'adesione al consorzio.
- **supporto istituzionale:** sollecitare il sostegno di enti governativi per favorire l'inclusione dei comuni esclusi.
- **valutazione dei risultati:** implementare un sistema di monitoraggio per valutare l'efficacia delle iniziative di coinvolgimento e apportare eventuali miglioramenti.
- **feedback continuo:** raccogliere feedback dai comuni esclusi per comprendere le loro esigenze e le eventuali difficoltà nell'adesione al consorzio.
- **condivisione di buone pratiche:** diffondere storie di successo e case study di comuni che hanno beneficiato dall'adesione al consorzio.
- **visite guidate:** organizzare visite presso i comuni già aderenti per mostrare direttamente i risultati ottenuti.

Benefici del principio di inclusività

L'inclusività nella gestione dei rifiuti apporta numerosi vantaggi su molteplici livelli, favorendo un approccio più efficiente, sostenibile e socialmente responsabile. Innanzitutto, si registra un netto miglioramento dell'efficienza operativa. La collaborazione tra più comuni consente di ottimizzare l'uso delle risorse tecniche e operative, riducendo sprechi e sovrapposizioni di attività. Questa sinergia permette di sfruttare appieno le economie di scala, traducendosi in una significativa riduzione dei costi operativi legati alla raccolta e allo smaltimento dei rifiuti. A livello economico, i benefici sono tangibili: la condivisione delle infrastrutture e delle risorse tra i comuni consorziati porta a una riduzione sostanziale dei costi, rendendo più efficiente l'uso delle risorse pubbliche. Inoltre, i consorzi di maggiori dimensioni hanno un accesso facilitato a finanziamenti e sovvenzioni, sia regionali che nazionali ed europee, dedicate alla gestione dei rifiuti e ai progetti di sostenibilità ambientale, offrendo ulteriori opportunità di miglioramento e sviluppo. Il miglioramento della qualità del servizio di gestione dei rifiuti è un altro aspetto rilevante. La partecipazione di più comuni garantisce una maggiore uniformità nel servizio su tutto il territorio consorziato, elevando il livello qualitativo complessivo. La collaborazione facilita inoltre l'introduzione di tecnologie innovative, come i sistemi di raccolta automatizzati e i programmi di riciclo avanzati, che rendono il servizio più efficiente e sostenibile nel lungo periodo. I vantaggi ambientali sono evidenti: una gestione integrata e inclusiva promuove pratiche di riciclo più efficaci e riduce sensibilmente la quantità complessiva di rifiuti inviati in discarica. Questo ha un impatto positivo sull'ambiente, riducendo l'impronta ecologica complessiva e migliorando l'efficienza logistica grazie a processi di smaltimento più ecologici e sostenibili. Anche i benefici sociali

legati a un consorzio inclusivo sono di grande rilevanza. Un approccio inclusivo nella gestione dei rifiuti incoraggia la partecipazione attiva dei cittadini, aumentando la consapevolezza e la responsabilità ambientale. Il coinvolgimento della popolazione in campagne di sensibilizzazione e programmi di educazione ambientale favorisce una maggiore adesione a pratiche sostenibili. Inoltre, la creazione di nuovi posti di lavoro nel settore della raccolta, dello smaltimento e del riciclo dei rifiuti può contribuire significativamente allo sviluppo economico delle comunità locali coinvolte, offrendo opportunità di occupazione stabile e qualificata. Un ulteriore vantaggio riguarda il potenziamento delle competenze tecniche e gestionali. La collaborazione tra comuni promuove lo scambio di conoscenze e il miglioramento continuo delle competenze del personale, che può beneficiare di una formazione specializzata e dell'accesso a infrastrutture moderne e tecnologicamente avanzate. I comuni consorziati possono così implementare le migliori pratiche del settore, migliorando l'efficacia delle loro operazioni e garantendo una gestione sostenibile e resiliente dei rifiuti. Infine, l'inclusività nella gestione dei rifiuti rafforza le relazioni intercomunali, promuovendo una cultura di cooperazione, solidarietà e condivisione delle risorse e dei servizi pubblici.

COMUNI CONVOLTI	
ALTE MADONIE	9/9
BASSE MADONIE	1/6
MADONIE IMERESI	3/6
	13/21
COLLABORAZIONE	14/26
% COMUNI COINVOLTI	**53,84%**



Piano Zucchi; ©Carmelo Di Salvo, 2023

BUSINESS PLAN

Sclafani Bagni; ©Luisa Lombardo, 2023

La predisposizione di un business plan dettagliato per i piccoli comuni è essenziale per garantire la pianificazione e la gestione efficace dei progetti locali, specialmente in un contesto di risorse limitate e sfide strutturali.

Un business plan ben strutturato non solo fornisce una roadmap strategica per lo sviluppo e la crescita del comune, ma rappresenta anche uno strumento fondamentale per attrarre finanziamenti, ottimizzare le risorse e monitorare l'implementazione delle iniziative.

In primo luogo, un business plan offre una visione chiara e coerente degli obiettivi a lungo termine e delle strategie necessarie per raggiungerli. Esso consente ai decisori locali di delineare le priorità, definire gli interventi strategici e pianificare le azioni concrete in risposta alle esigenze specifiche del territorio. Questo approccio mirato permette di concentrare gli sforzi e le risorse su progetti che hanno un impatto significativo e duraturo sulla comunità.

Dal punto di vista finanziario, la redazione di un business plan è cruciale per l'accesso a finanziamenti esterni e per la gestione delle risorse economiche del comune. Un piano ben articolato, che includa analisi dettagliate dei costi e delle fonti di finanziamento, aumenta la credibilità del progetto agli occhi di investitori pubblici e privati, come i fondi europei, le banche e le fondazioni. Inoltre, un business plan fornisce una base solida per la rendicontazione e la giustificazione delle spese, facilitando il monitoraggio e la verifica dei risultati.

L'importanza di un business plan si estende anche alla gestione e alla valutazione delle performance. La definizione di obiettivi misurabili e di indicatori chiave di prestazione (KPI) permette di monitorare progressi e risultati, apportando eventuali correttivi in corso d'opera. Questo processo di valutazione continua aiuta a garantire che i progetti rimangano in linea con le aspettative e che le risorse siano utilizzate in modo efficiente.

Inoltre, la pianificazione attraverso un business plan favorisce l'integrazione e la collaborazione tra i diversi attori locali, quali istituzioni, imprese e associazioni. La definizione chiara dei ruoli e delle responsabilità contribuisce a creare una rete di supporto e sinergie, facilitando l'attuazione dei progetti e migliorando la coesione sociale e il coinvolgimento della comunità.

Un business plan per i piccoli comuni deve considerare anche le specificità territoriali e le esigenze della popolazione, affrontando tematiche come lo sviluppo sostenibile, la valorizzazione del patrimonio culturale e naturale, e l'innovazione sociale. L'inclusione di questi elementi nel piano strategico contribuisce a garantire che le iniziative siano non solo efficaci, ma anche rilevanti e rispettose delle caratteristiche locali.

In sintesi, la previsione e la redazione di un business plan per i piccoli comuni sono di fondamentale importanza per assicurare una pianificazione strategica e operativa di successo. Questo strumento facilita la gestione delle risorse, migliora l'accesso ai finanziamenti, supporta la valutazione delle performance e promuove la cooperazione tra gli attori locali, contribuendo così a uno sviluppo armonioso e sostenibile del territorio.

CREAZIONE DI UN BUSINESS PLAN PER LE AREE INTERNE ITALIANE

1. Identificare l'opportunità
Il primo passo nella creazione di un business plan per le aree interne italiane è identificare un'opportunità o una sfida specifica che richiede un intervento. Questo potrebbe includere la creazione di un'azienda, lo sviluppo di un progetto turistico, o qualsiasi altra iniziativa economica.

2. Analisi del contesto
Eseguire un'analisi dettagliata del contesto locale è essenziale. Questa analisi dovrebbe includere dati demografici, aspetti geografici, economici e sociali dell'area in cui si intende operare. È importante anche considerare le specificità delle aree interne, come la disponibilità di risorse naturali, le infrastrutture esistenti e le esigenze della popolazione.

3. Definire gli obiettivi
Definire chiaramente gli obiettivi del business plan. Gli obiettivi dovrebbero essere SMART (Specifici, Misurabili, Attuabili, Rilevanti e Temporizzati) per garantire una direzione chiara e misurabile.

4. Pianificare le attività
Descrivere le attività specifiche che saranno necessarie per raggiungere gli obiettivi. Questo dovrebbe includere una pianificazione temporale, le risorse necessarie e le responsabilità assegnate.

5. Analisi di mercato
Condurre un'analisi di mercato approfondita per comprendere il pubblico di riferimento, la concorrenza e le tendenze del settore.
Questo passo è fondamentale per sviluppare una strategia di marketing efficace.

6. Pianificazione finanziaria
Stabilire un piano finanziario dettagliato, compreso un budget, previsioni finanziarie e fonti di finanziamento potenziali. Questo è essenziale per dimostra-

re la fattibilità del progetto.

7. Struttura organizzativa

Definire la struttura organizzativa e le competenze necessarie per gestire il progetto o l'azienda.

8. Valutazione dei rischi

Identificare i rischi potenziali e sviluppare un piano per affrontarli. Questo dimostra la capacità di mitigare le sfide che potrebbero sorgere.

9. Monitoraggio e valutazione

Definire indicatori chiave di performance (KPI) e metodi di monitoraggio per valutare il successo del piano.

10. Comunicazione e promozione

Creare un piano di comunicazione per coinvolgere le parti interessate, tra cui la comunità locale, gli investitori e le istituzioni governative.

SCHEMA TIPO DI FATTIBILITÀ DI UN INTERVENTO

Per valutare la fattibilità di un intervento nelle aree interne italiane, è possibile utilizzare l'approccio seguente:

- **analisi SWOT:** identificare i punti di forza, le debolezze, le opportunità e le minacce relative all'intervento.
- **analisi di mercato:** esaminare la domanda e l'offerta del mercato, identificare i competitor e comprendere le tendenze.
- **analisi delle risorse:** valutare la disponibilità di risorse finanziarie, umane e materiali necessarie per l'intervento.
- **analisi delle risorse locali:** esaminare le risorse locali come infrastrutture, competenze locali e reti di supporto.
- **valutazione economica:** calcolare il potenziale ritorno sull'investimento e determinare la sostenibilità economica del progetto.
- **valutazione ambientale e sociale:** considerare l'impatto ambientale e sociale dell'intervento e sviluppare strategie per mitigare gli impatti negativi.
- **legislazione e regolamenti:** assicurarsi di essere conformi a tutte le leggi e i regolamenti locali e nazionali.
- **pianificazione finanziaria:** stendere previsioni finanziarie realistiche e identificare le fonti di finanziamento.
- **piano operativo:** definire un piano dettagliato per l'attuazione dell'intervento, inclusi tempi e attività.
- **piano di monitoraggio e valutazione:** stabilire un sistema di monitoraggio per valutare il progresso e apportare eventuali correzioni.

Un business plan ben strutturato è fondamentale per il successo di qualsiasi intervento o impresa nelle aree interne italiane.

Dovrebbe essere un documento dinamico che può essere adattato e rivisto in base all'evoluzione delle condizioni e delle circostanze. Inoltre, coinvolgere le parti interessate locali e lavorare in collaborazione con le istituzioni pubbliche può essere un passo importante per garantire il successo di un'intervento in queste aree.

Cefalù; ©Il Cefalino, 2024

BUSINESS PLAN PER LA DIGITALIZZAZIONE DELLE PRATICHE AMMINISTRATIVE COMUNALI

Identificazione dell'Opportunità:
L'obiettivo primario è quello di migliorare l'efficienza, la trasparenza e l'accessibilità delle pratiche amministrative nel Comune dell'entroterra siciliano delle Madonie attraverso l'implementazione di soluzioni digitali.

Analisi del Contesto:
Il Comune delle Madonie, rinomato per la sua bellezza naturale, si trova spesso ad affrontare sfide legate alla lentezza e alla complessità delle pratiche amministrative. La digitalizzazione può rappresentare un'opportunità significativa per superare tali ostacoli.

Definizione degli Obiettivi:
- Ridurre i tempi di elaborazione delle pratiche amministrative del comune del 30% entro il primo anno.
- Aumentare la soddisfazione del cittadino nella gestione delle pratiche amministrative del 20% entro il secondo anno.
- Migliorare la trasparenza delle operazioni amministrative.
- Pianificazione delle Attività:
- Acquisizione e implementazione di un software di gestione amministrativa digitale entro il primo trimestre.
- Formazione del personale comunale sull'utilizzo del software entro il secondo trimestre.
- Avvio della digitalizzazione dei processi amministrativi a partire dal terzo trimestre.

Analisi di Mercato:
Identificazione dei principali processi amministrativi adatti alla digitalizzazione.
Ricerca di fornitori di software specializzati in soluzioni per la pubblica amministrazione.

Pianificazione Finanziaria:
Stima del budget necessario per l'acquisizione del software e la formazione del personale.
Individuazione delle fonti di finanziamento, inclusi contributi da enti locali o sovvenzioni.

Struttura Organizzativa:
Nomina di un responsabile del progetto di digitalizzazione.
Costituzione di un team di progetto che includa personale comunale con competenze tecniche.

Valutazione dei Rischi:
Identificazione dei potenziali problemi tecnici legati all'implementazione del software.
Considerazione della resistenza al cambiamento tra il personale.

Monitoraggio e Valutazione:
Definizione di indicatori chiave di performance per misurare l'efficienza, come il tempo medio di elaborazione delle pratiche.
Valutazione periodica del grado di soddisfazione dei cittadini attraverso sondaggi.

Comunicazione e Promozione:
Informazione della comunità locale sui miglioramenti previsti.
Coinvolgimento attivo dei cittadini nelle fasi di test e feedback per garantire una maggiore adesione al cambiamento.

Questo business plan fornisce una guida per la digitalizzazione delle pratiche amministrative comunali nel Comune delle Madonie. Tuttavia, è importante adattare il piano alle esigenze specifiche e alle risorse disponibili. La collaborazione con le istituzioni locali e il coinvolgimento attivo dei cittadini sono fondamentali per il successo del progetto.

Caltavuturo;
©Luisa Lombardo, 2023

VALUTAZIONE DEI CRITERI SMART PER LA GESTIONE DEI FINANZIAMENTI

Sclafani Bagni; ©Quelli del Parco delle Madonie, 2023

I piccoli comuni, spesso caratterizzati da risorse limitate e da una popolazione ristretta, affrontano sfide uniche nella gestione e nello sviluppo delle loro comunità. Tuttavia, i progetti europei rappresentano una risorsa cruciale per questi territori, offrendo opportunità significative per avviare iniziative e promuovere il progresso locale.

L'Unione Europea, attraverso diversi programmi e fondi, sostiene progetti che mirano a rafforzare la coesione economica, sociale e territoriale. Per i piccoli comuni, l'accesso a questi progetti può fare la differenza tra stagnazione e crescita, permettendo di sviluppare infrastrutture, promuovere il turismo, preservare il patrimonio culturale e ambientale e stimolare l'innovazione sociale ed economica.

L'importanza dei progetti europei si manifesta in diversi ambiti:

1. **Sviluppo delle Infrastrutture:** I fondi europei possono essere utilizzati per migliorare le infrastrutture locali, come strade, ponti, impianti di trattamento delle acque e reti di trasporto. Questi investimenti non solo migliorano la qualità della vita dei residenti, ma anche attraggono turisti e investitori, stimolando l'economia locale.

2. **Promozione del Turismo e Cultura:** Progetti finanziati dall'UE possono valorizzare il patrimonio storico e culturale dei piccoli comuni, creando percorsi turistici, restaurando monumenti e promuovendo eventi culturali. Questo aiuta a preservare le tradizioni locali e a generare nuove fonti di reddito attraverso il turismo.

3. **Sostenibilità Ambientale:** L'Unione Europea promuove progetti che mirano alla sostenibilità ambientale. Per i piccoli comuni, questo significa poter accedere a finanziamenti per iniziative di energia rinnovabile, gestione dei rifiuti e protezione delle risorse naturali, contribuendo così alla creazione di comunità più green e resilienti.

4. **Innovazione Sociale ed Economica:** I progetti europei offrono anche opportunità per stimolare l'innovazione sociale e economica. Attraverso il sostegno a start-up locali, progetti di inclusione sociale e programmi di formazione, i piccoli comuni possono avviare iniziative che migliorano il benessere della comunità e creano nuovi posti di lavoro.

5. **Collaborazione e Networking:** I progetti europei incoraggiano la cooperazione tra comuni e regioni. Questa rete di collaborazione consente ai piccoli comuni di condividere risorse, conoscenze e migliori pratiche, amplificando l'impatto delle loro iniziative e promuovendo lo sviluppo regionale integrato.

L'uso di progetti europei nei piccoli comuni rappresenta una leva fondamentale per il loro sviluppo sostenibile e integrato.

L'accesso a finanziamenti e supporto tecnico dell'Unione Europea non solo consente di superare le limitazioni locali, ma stimola anche la crescita economica, la valorizzazione del patrimonio e la creazione di comunità più vivibili e dinamiche.

Investire in queste opportunità è cruciale per garantire che i piccoli comuni possano prosperare e contribuire al progresso complessivo dell'Europa.

Ecco, di seguito, alcuni esempi sulla gestione dei fondi europei e le possibili occasioni di finanziamento.

Vecchia Salina ad Alimena;
©Luisa Lombardo, 2023

1. Gestione dei fondi e dei progetti europei

Attualmente, la preparazione anticipata nella gestione dei fondi erogati dall'Unione Europea riveste un'importanza considerevole, in particolare per i comuni minori e periferici italiani, che spesso presentano carenze infrastrutturali rispetto ai centri urbani principali.

È pertanto essenziale che ciascun ente comunale sviluppi preventivamente progetti mirati a migliorare il proprio territorio.

Questo può essere realizzato mediante la promozione di concorsi che stimolino la generazione di idee e la valutazione della fattibilità tecnico-economica delle proposte.

Una preparazione adeguata consente di presentare, al momento dell'emanazione dei bandi di finanziamento, proposte solide e ben strutturate, offrendo al contempo il tempo necessario per apportare eventuali modifiche in risposta alle specifiche richieste.

Inoltre, una tempestiva divulgazione delle informazioni riguardanti i fondi disponibili, comprese le tempistiche previste per l'avvio dei bandi, le categorie di intervento coinvolte e i dettagli relativi al contesto di riferimento, rappresenta una strategia intelligente e opportuna.

Questa prassi consente di evitare il rischio di ritardi nella presentazione delle proposte progettuali e di garantire una partecipazione efficace e tempestiva ai finanziamenti disponibili.

2. Fondo di sostegno ai comuni marginali

L'Amministrazione Comunale propone l'implementazione di un programma di contributi economici, fino a un massimo di 5.000 euro, destinato a incentivare il trasferimento di residenza nel comune madonita prescelto.

Questo intervento è progettato per sostenere l'acquisto e la ristrutturazione di immobili destinati a diventare abitazioni principali, contribuendo così a rinvigorire il tessuto abitativo e sociale del territorio.

Il programma si rivolge a diverse categorie di destinatari. In particolare, rappresenta un'opportunità significativa per giovani coppie, che possono così ricevere un aiuto finanziario per l'acquisto della loro prima casa, facilitando l'ingresso nel mercato immobiliare.

Inoltre, è pensato per giovani professionisti all'inizio della loro carriera, che potrebbero beneficiare di un sostegno economico per stabilirsi in una nuova comunità e avviare la loro vita lavorativa in un contesto più favorevole.

Anche coloro che cercano di allontanarsi dai centri urbani principali per una vita più tranquilla e immersa nella natura potrebbero trovare nel programma un incentivo a trasferirsi.

Parallelamente, la proposta ha l'ambizioso obiettivo di affrontare e contrastare il fenomeno dello spopolamento che affligge numerosi piccoli comuni italiani, inclusa la nostra comunità.

Promuovendo l'insediamento di nuovi residenti e incentivando la riqualificazione del patrimonio immobiliare, si intende rivitalizzare il comune, stimolare l'economia locale e rafforzare la coesione sociale.

3. Fundraising

Il fundraising è un campo multidisciplinare, con una significativa predominanza femminile, che richiede una varietà di competenze specialistiche. I professionisti del settore si dividono in diverse aree di specializzazione: il *corporate fundraising*, che favorisce le relazioni tra imprese profit e organizzazioni non profit tramite la Corporate Social Responsibility; il settore culturale, che collabora con istituzioni culturali e turistiche per promuovere l'accesso alla cultura; i *digital fundraiser*, responsabili della gestione online e dell'interazione con la comunità digitale; e i fundraiser specializzati nella *scrittura di comunicazioni per il direct mailing* e nella *cura dei donatori diretti (Donor care)*.

Gli Europrogettisti sono specializzati nella redazione di progetti per rispondere ai bandi europei, con una conoscenza approfondita dei vari programmi disponibili, come Erasmus, Creative Europe e Life, poiché i requisiti di partecipazione variano a seconda del programma.

L'importanza del fundraising è cresciuta dopo la crisi del 2008, che ha ridotto i finanziamenti pubblici e indebolito il ruolo dello Stato. Sebbene il fundraising sia una disciplina relativamente recente, sta diventando sempre più professionale e specializzata, rispondendo alle esigenze del contesto attuale.

I fundraiser operano per enti del Terzo Settore, come associazioni culturali e cooperative sociali, comuni e istituzioni. Svolgono un ruolo cruciale nella costruzione di relazioni con gli stakeholder territoriali e nella promozione della donazione, coinvolgendo la comunità nella missione dell'ente. Allo stesso tempo, gli Europrogettisti si dedicano alla preparazione di progetti per bandi europei, adattandosi ai requisiti specifici di ciascun programma.

Parco delle Madonie; ©Salvatore Fiume, 2023

4. Piccolo Comune “Amico”

Il progetto “Piccolo Comune Amico” è concepito per valorizzare i piccoli Comuni italiani con meno di 5.000 abitanti, riconoscendo il loro ruolo cruciale nella conservazione delle tradizioni culturali, dei prodotti alimentari di alta qualità e del patrimonio artistico nazionale.

Questi Comuni, che costituiscono una parte significativa del tessuto territoriale italiano, sono considerati custodi di una ricchezza culturale e socio-economica che spesso sfugge ai riflettori principali.

Il progetto si propone di promuovere e sostenere lo sviluppo delle piccole realtà locali, attraverso il riconoscimento delle loro eccellenze nei settori agroalimentare, artigianato, innovazione sociale, cultura, arte, storia ed economia circolare. L’obiettivo è quello di valorizzare le specificità di questi territori e contribuire a contrastare il fenomeno dello spopolamento che minaccia molte di queste comunità.

Attraverso il “Piccolo Comune Amico”, si mira a creare una rete di comuni che, sebbene piccoli nella dimensione, sono ricchi di risorse e potenzialità. Il progetto incoraggia la promozione delle loro qualità distintive e supporta il rafforzamento dell’identità locale. Inoltre, favorisce l’emergere di pratiche sostenibili e innovative, stimolando lo sviluppo economico e sociale all’interno di queste realtà.

Il valore del progetto risiede nella sua capacità di mettere in luce e valorizzare le risorse uniche di questi piccoli Comuni, creando un modello che possa servire da esempio per altre iniziative volte a sostenere e promuovere le comunità locali meno visibili ma ricche di potenziale.

5. Community Manager

Il Community Manager è una figura esperta nell’agevolare progetti Erasmus+ e si specializza in questioni di genere e attivismo giovanile per lo sviluppo locale. Questi professionisti, laureati, ricercatori e specialisti nei campi dello sviluppo locale, della progettazione, dell’urbanistica e dell’animazione sociale, svolgono un ruolo cruciale nell’animazione sociale e culturale del territorio, oltre che nell’attivazione delle risorse locali.

Il loro ambito di competenza non si limita alla gestione della comunicazione attraverso i canali social di un’azienda, ma include anche la cura del rapporto e dell’interazione con i clienti attuali e potenziali.

Il Community Manager, inizialmente, pianifica la struttura della comunità e gli eventi, tenendo conto delle richieste degli utenti o degli obiettivi del committente. Successivamente, definisce le modalità di aggregazione, sceglie gli strumenti, i servizi e le categorie di discussione. Se necessario, può avvalersi di moderatori, promotori o altre figure che lo assistono nella gestione della comunità stessa. L’obiettivo è creare un ambiente in cui i membri si sentano liberi e sicuri di esprimersi, dialogare, comunicare e collaborare senza timori di giudizio o malintesi. Questo approccio contribuisce alla crescita e allo sviluppo di una comunità virtuale solida e positiva.

Gangi dal drone; ©Carmelo Di Salvo, 2023

PNRR - I progetti sulle Madonie

Quattro comuni del Parco delle Madonie sono stati inclusi nel Bando PNRR - Linea B, precisamente Gratteri, Polizzi Generosa, San Mauro Castelverde e Isnello (Fig. 2). Questi interventi prevedono il recupero dell'edilizia presente nei centri storici e includono:

- **Polizzi Generosa:** 9 interventi immateriali (concerti, festival, mostre d'arte, incontri seminariali) e 4 interventi materiali su beni culturali, come la riqualificazione di Vicolo Cilluffo, la musealizzazione del Palazzo della Cultura e la creazione del Parco della Musica.
- **Isnello:** il progetto "Itinera" si concentra sul Palazzo Termine di Isnello, risalente al XVIII secolo e di grande interesse architettonico e storico.
- **Gratteri:** valorizzazione e riqualificazione del patrimonio culturale e naturale locale, potenziamento del turismo e ristrutturazione di edifici pubblici.
- **San Mauro Castelverde:** miglioramento delle infrastrutture locali con un focus sulla sostenibilità e l'efficienza energetica, valorizzazione del patrimonio naturale e culturale e creazione di spazi per attività culturali e sociali.

Linee Guida

- **coinvolgimento attivo di tutti i comuni:** Ogni comune, indipendentemente dalle dimensioni o risorse, deve essere coinvolto in modo equo nelle decisioni riguardanti la valorizzazione culturale e sociale del territorio. Questo assicura che ogni area contribuisca allo sviluppo complessivo.
- **collaborazione intercomunale:** La gestione condivisa delle risorse, delle competenze e dei progetti tra i comuni favorisce l'ottimizzazione degli investimenti e la riduzione delle disparità tra le diverse realtà. La collaborazione aiuta a valorizzare ogni singolo comune in maniera integrata e coesa.
- **valorizzazione del patrimonio locale:** Ogni comune deve identificare e promuovere il proprio patrimonio storico, architettonico e naturale in sinergia con gli altri comuni. L'implementazione di interventi culturali, materiali e immateriali è essenziale per arricchire l'identità del territorio e rafforzare il legame tra tradizione e innovazione.
- **accessibilità e fruibilità:** Migliorare le infrastrutture e garantire un'accessibilità inclusiva per residenti e turisti è fondamentale per rendere il territorio fruibile a tutti. La sostenibilità deve essere centrale in tutti gli interventi, sia in termini ambientali che economici.
- **promozione culturale condivisa:** Ogni comune deve contribuire a una visione culturale comune, basata su eventi e attività che coinvolgano non solo i residenti, ma anche i visitatori. Concerti, festival, mostre e iniziative sociali sono strumenti chiave per la promozione di un'identità culturale comune e unitaria.

Benefici del principio di inclusività

I benefici dell'inclusività per i comuni del comprensorio madonita sono molteplici e si manifestano su diversi livelli, economico, sociale, culturale e ambientale. In primo luogo, la collaborazione tra i comuni del territorio consente di ottimizzare le risorse disponibili e di ridurre i costi operativi, unendo forze e competenze per affrontare sfide comuni. Attraverso la condivisione di infrastrutture, tecnologie e conoscenze, i comuni riescono a sfruttare appieno le economie di scala, riducendo le spese legate alla gestione di servizi essenziali e migliorando al contempo la qualità degli stessi. Questo approccio collaborativo facilita l'accesso a finanziamenti e sovvenzioni, soprattutto in ambito europeo, permettendo di ottenere migliori condizioni economiche per la realizzazione di progetti di sviluppo.

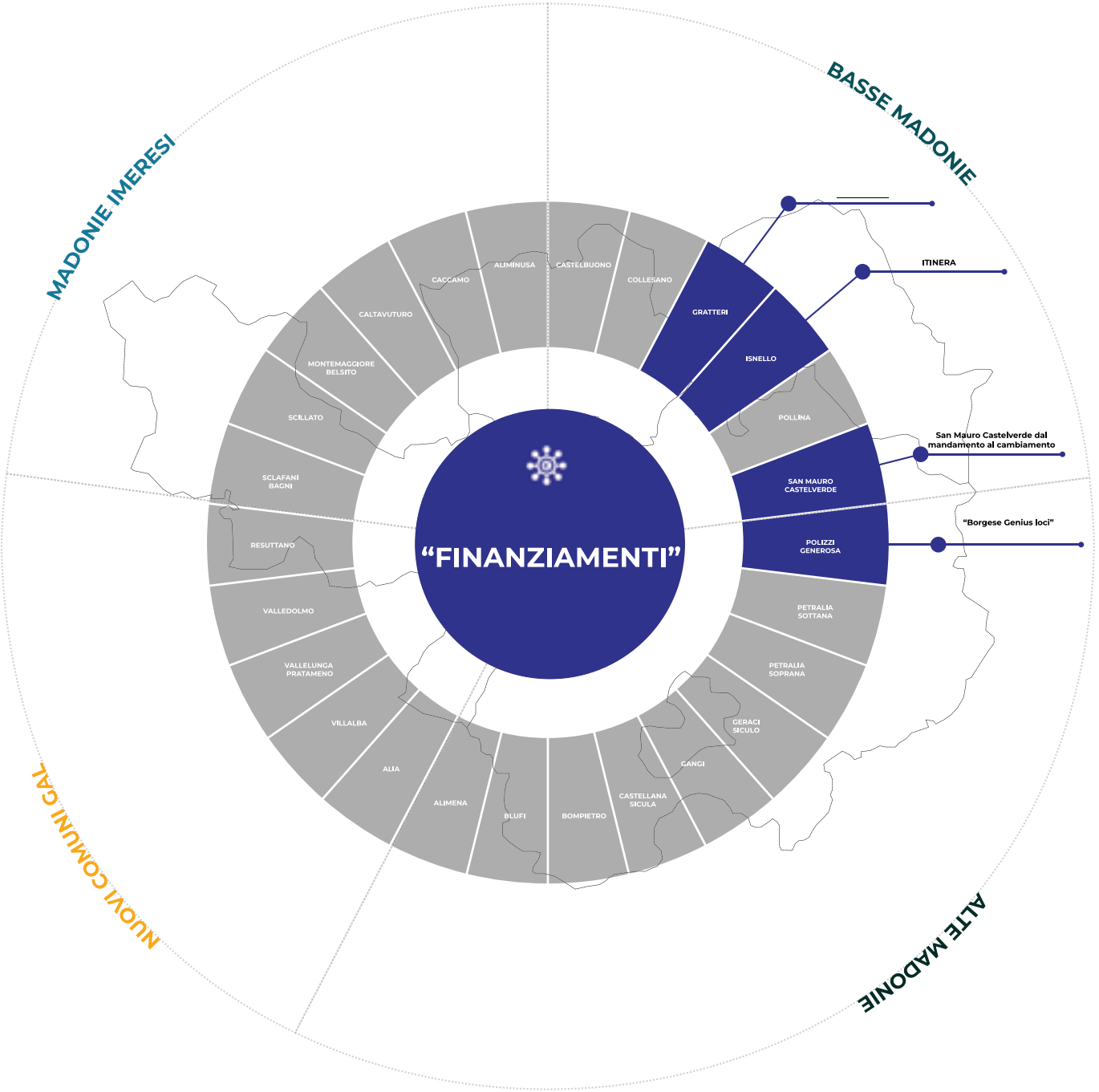
Dal punto di vista sociale e culturale, i progetti inclusivi rivestono un ruolo fondamentale nella promozione del coinvolgimento attivo dei cittadini, rafforzando la partecipazione civica e creando una rete di solidarietà tra le diverse comunità del comprensorio. Gli interventi mirati sui beni culturali, come la riqualificazione del patrimonio storico e architettonico, e le attività immateriali, quali festival, concerti, mostre e incontri, contribuiscono a valorizzare l'identità locale, alimentando un forte senso di appartenenza e coesione sociale. Questi eventi e iniziative non solo celebrano le tradizioni locali, ma stimolano anche l'interesse dei visitatori e rafforzano l'interazione tra abitanti e turisti, arricchendo la vita culturale del territorio.

La valorizzazione condivisa del patrimonio culturale e naturale è un ulteriore elemento chiave, poiché potenzia l'attrattività turistica dell'intero comprensorio madonita. La messa in rete dei vari comuni e dei loro punti di interesse turistico genera un indotto economico significativo, creando nuove opportunità di lavoro legate al turismo, all'artigianato locale, alla ristorazione e alle attività ricreative. Questo contribuisce al rilancio dell'economia locale, favorendo lo sviluppo di nuove iniziative imprenditoriali e incrementando le prospettive di crescita sostenibile.

In termini ambientali, l'inclusività incoraggia una gestione più efficiente e sostenibile delle risorse naturali e paesaggistiche. I progetti di riqualificazione, come quelli previsti a San Mauro Castelverde, che includono interventi per l'efficienza energetica e la riduzione dell'impatto ambientale, migliorano la vivibilità dei centri storici e delle aree rurali, riducendo il consumo energetico e promuovendo l'uso di energie rinnovabili. La sostenibilità diventa un

principio guida che non solo preserva il patrimonio naturale, ma contribuisce anche a migliorare la qualità della vita degli abitanti, rendendo i comuni più attrattivi per nuovi residenti e per visitatori.
Infine, la creazione di spazi per attività culturali e sociali, come prevista nei progetti a San Mauro Castelverde e Gratteri, gioca un ruolo determinante nello sviluppo economico e sociale delle comunità locali. Questi spazi favoriscono l'incontro e lo scambio tra cittadini, supportano l'organizzazione di eventi comunitari e stimolano la partecipazione delle nuove generazioni, incentivando la nascita di progetti di imprenditoria giovanile e la promozione del territorio come destinazione innovativa e accogliente. Attraverso l'inclusività, i comuni del comprensorio madonita possono affrontare con successo le sfide del futuro, promuovendo uno sviluppo equilibrato e duraturo che mette al centro il benessere delle persone e la valorizzazione delle risorse locali.

COMUNI CONVOLTI	
ALTE MADONIE	1/9
BASSE MADONIE	3/6
MADONIE IMERESI	0/6
	4/21
COLLABORAZIONE	4/26
% COMUNI COINVOLTI	**15,38%**



VERSO GLI OBIETTIVI DELL'AGENDA 2030

Nel 2015, l'Italia, insieme agli altri 192 Stati membri delle Nazioni Unite, ha aderito all'Agenda 2030 per lo Sviluppo Sostenibile, un programma ambizioso strutturato attorno a 17 Obiettivi di Sviluppo Sostenibile (Sustainable Development Goals - SDGs) e 169 Target, volto a promuovere la prosperità e lo sviluppo globale nel rispetto e nella protezione del pianeta.

Questo Atlante si propone di contribuire al raggiungimento di 9 dei 17 obiettivi di sviluppo sostenibile, con particolare attenzione alle aree rurali. L'obiettivo principale è quello di soddisfare le esigenze presenti senza compromettere la capacità delle future generazioni di soddisfare le proprie necessità. Il focus dell'Atlante è sul miglioramento del benessere nelle zone rurali, promuovendo sia lo sviluppo economico che la salvaguardia ambientale.

Il progetto affronta temi cruciali come la pace, lo Stato di diritto e il buon governo, e si configura come uno strumento fondamentale per sostenere lo sviluppo sostenibile nelle comunità rurali. Le motivazioni alla base di questo impegno sono molteplici e rilevanti. In primo luogo, il raggiungimento degli obiettivi di sviluppo sostenibile nelle aree rurali è essenziale per il benessere delle popolazioni locali, garantendo l'accesso a risorse fondamentali quali acqua potabile, cibo e servizi sanitari, e favorendo al contempo la creazione di opportunità economiche e di lavoro, contribuendo così a contrastare la povertà e a promuovere una crescita economica sostenibile.

Dal punto di vista ambientale, l'attenzione rivolta alle aree rurali è cruciale, poiché esse spesso costituiscono serbatoi di biodiversità e risorse naturali. La conservazione e la gestione sostenibile di questi territori sono indispensabili per la protezione dell'ecosistema globale e per la mitigazione dei cambiamenti climatici. Infine, promuovere la pace, lo Stato di diritto e il buon governo nelle aree rurali è essenziale per garantire la stabilità sociale, la coesione comunitaria e la partecipazione attiva delle popolazioni locali nei processi decisionali, contribuendo così alla creazione di contesti più resilienti e capaci di affrontare efficacemente le sfide globali e locali.

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Nello specifico:

- Regione Puglia. *Linee guida per il recupero, la manutenzione e il riuso dell'edilizia e dei beni rurali.*
- Comune di Cerea, Provincia di Verona. *Prontuario edificazione zona agricola.*
- Parco Agricolo Sud Milano. *Raccolta delle modalità di intervento nel paesaggio del P.A.S.M.*
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- G.A.L. Mongioie. *Manuale per il recupero di elementi di tipicità dell'architettura locale.*
- Comune di Chiavenna, Regione Lombardia. *Guida per la qualità degli interventi sull'architettura rurale.*
- Regione Piemonte. *Manuale guida per l'integrazione degli impianti di produzione di energie rinnovabili negli edifici esistenti.*
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RECUPERARE L'ARCHITETTURA DI BASE MADONITA
Linee guida per Polizzi Generosa

Luisa Lombardo

ALLEGATO 3

Università degli Studi di Palermo
DIPARTIMENTO DI ARCHITETTURA UNIPA
DOTTORATO DI RICERCA IN ARCHITETTURA ARTI E PIANIFICAZIONE

Dottorato in Architettura, Arti e Pianificazione
Dipartimento di Architettura DARCH
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architettura Tecnica

CENTRI MINORI INTELLIGENTI
NEL PARCO DELLE MADONIE IN SICILIA

STRATEGIE DI RECUPERO E VALORIZZAZIONE DELLE AREE INTERNE

ALLEGATO 3

RECUPERARE L'ARCHITETTURA DI BASE MADONITA
Linee guida per Polizzi Generosa

IL DOTTORE
Ing. Luisa Lombardo

IL COORDINATORE
Prof. Arch. Marco Rosario Nobile

IL TUTOR
Prof. Ing. Ph.D. Tiziana Campisi

Il Tutor della SopriPa
Arch. Delia Geraci

IL CO-TUTOR
Prof. Arch. Ph.D. Simona Colajanni

Il Tutor (R+)
Prof. Arturo Zaragozá Catalán
Co-Tutor (UPV)
Prof. Rafael Marín Sánchez

CICLIO XXXVII
ANNO CONSEGUIMENTO TITOLO 2025

Luisa Lombardo

RECUPERARE L'ARCHITETTURA DI BASE MADONITA

Linee guida per Polizzi Generosa

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Università degli Studi di Palermo

DIPARTIMENTO DI ARCHITETTURA UNIPA

DOTTORATO DI RICERCA IN ARCHITETTURA ARTI E PIANIFICAZIONE

Ph.D. in Architecture, Arts, and Planning
Department of Architecture (DARCH)
G.S.D. 08/CEAR-08, S.S.D. CEAR-08/A - Architectural Engineering

SMART VILLAGES
IN THE MADONIE PARK IN SICILY

STRATEGIES FOR THE REHABILITATION AND ENHANCEMENT OF INNER AREAS

ANNEX 3

REHABILITATING MADONITA VERNACULAR ARCHITECTURE
Guidelines for Polizzi Generosa

THE DOCTOR
Eng. Luisa Lombardo

THE COORDINATOR
Prof. Arch. Marco Rosario Nobile

THE SUPERVISOR
Prof. Eng. Ph.D. Tiziana Campisi

SopriPa Supervisor
Arch. Delia Geraci

THE CO-SUPERVISOR
Prof. Arch. Ph.D. Simona Colajanni

(R+) Supervisor
Prof. Arturo Zaragozá Catalán
(UPV) Co-Supervisor
Prof. Rafael Marín Sánchez

CYCLE XXXVII
YEAR OF DEGREE AWARD 2025

RECUPERARE L'ARCHITETTURA DI BASE MADONITA
Linee guida per Polizzi Generosa

Autore

Luisa Lombardo
PhD Student, Dipartimento di Architettura, Università degli Studi di Palermo

Coordinamento Scientifico

UNIPA
Tiziana Campisi
Professore Ordinario, Dipartimento di Architettura, Università degli Studi di Palermo

REAL ACADEMIA DE BELLAS ARTES DE SAN CARLOS DE VALENCIA e UNIVERSITÀ POLITECNICA DI VALENCIA
Arturo Zaragozá Catalán
Doctor Arquitecto, Inspector de Patrimonio Artístico de la Generalitat Valenciana (1983-2018), Académico de número de la Real Academia de Bellas Artes de San Carlos de Valencia, Académico Correspondiente de la Real Academia de Bellas Artes de San Fernando de Madrid.

Rafael Marín-Sánchez
Profesor Titular de Historia de la Construcción Departamento de Construcciones Arquitectónicas Universitat Politècnica de València (Spain)

SOPRINTENDENZA AI BENI CULTURALI E AMBIENTALI DELLA PROVINCIA DI PALERMO
Delia Geraci
Architetto, U.O. 02 - Sezione per i beni architettonici e storico-artistici, paesaggistici e demoetnoantropologici

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Investimento 2.1: "Attrattività dei borghi storici", finanziato dall'Unione europea – NextGeneration EU. Dal titolo: "G.A. Borgese genius loci. Alla scoperta del territorio e delle tradizioni. La Cultura e la Bellezza per la rigenerazione culturale e sociale e la valorizzazione del patrimonio pubblico. Interventi finalizzati all'incremento dell'attrattività del borgo".

Con la collaborazione di

Università degli Studi di Palermo - Dipartimento di Architettura
Universitat Politècnica de València
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Chiesa di San Domenico; ©Luisa Lombardo, 2024

Abstract

The recent debate on the recovery and enhancement of Italian inner rural areas has highlighted the need to find a solution for the promotion of the rural areas of our territory.

At the center of the Mediterranean and Sicily, in the Northern part, insists the Madonie Park, a UNESCO Geopark since 2004.

In addition to collecting fauna and flora species of great value, it includes 21 inner rural villages, which have preserved history , culture, millenary traditions and arts and architectures of great importance not only for Sicily, but also for the Country.

Municipalities united by a common basic architecture and by the presence of the Landscape Plan bound by the Code of Cultural Heritage and Landscape which, although on the one hand protects, on the other forces them to a condition of non-simultaneous action in the functional and typological recovery.

This handbook concerns the rehabilitation of the built heritage of one of the twenty-one municipalities of the Madonie Park, the municipality of Polizzi Generosa.

Starting from the examination of the basic building construction techniques insistent in the area, thanks to previous researches carried out on the subject, and evaluating the present protected heritage, the manual aims to identify the possible degrees of intervention and a virtuous recovery plan of the village, but also fot the Madonie District.

The thesis is part of the doctoral path of Ing. Luisa Lombardo, assisted by the Supervisor Prof. Tiziana Campisi, Associate Professor of the Department of Architecture, University of Palermo, on whose topic she has been working for some time.

She was also joined by Prof. Simona Colajanni, co-Supervisor and Associate Professor of the Department of Architecture.

Also of great help is the support of the Prof. Arturo Zaragozá Catalán of the Real Academia de Bellas Artes de San Carlos de Valencia and Prof. Rafael Marín-Sánchez of the Universitat Politècnica de Valencia, Supervisors during the doctoral research period abroad at the Real Academia de Bellas Artes de San Carlos de Valencia and the Universitat Politècnica de València.

The manual is the result of the process begun with the Superintendency of Cultural and Environmental Heritage of the Province of Palermo, whit the Supervisor Arch. Delia Geraci.

The doctoral thesis takes as a reference the possibility of transforming the 21 municipalities of the Madonie area in Sicily into a network of smart villages, with the aim of safeguarding / enhancing the built heritage, however, bringing it back to contemporary technological conditions and in compliance with the stringent requirements deriving from the PNRR and the EU Green Deal and EU Bauhaus.

Finally, these guidelines represent support tool for the Polizzi Municipality's Building Regulations and will be an annex to it together with the Atlas of technological solutions for the recovery and valorisation of the inner areas of the Madonie Park, as operational tools for the smart rehabilitation of the area.

La maretta di Polizzi Generosa; ©Luigi Parisi, 2022

Chiesa di San Nicolò De Franchis; ©Luisa Lombardo, 2024

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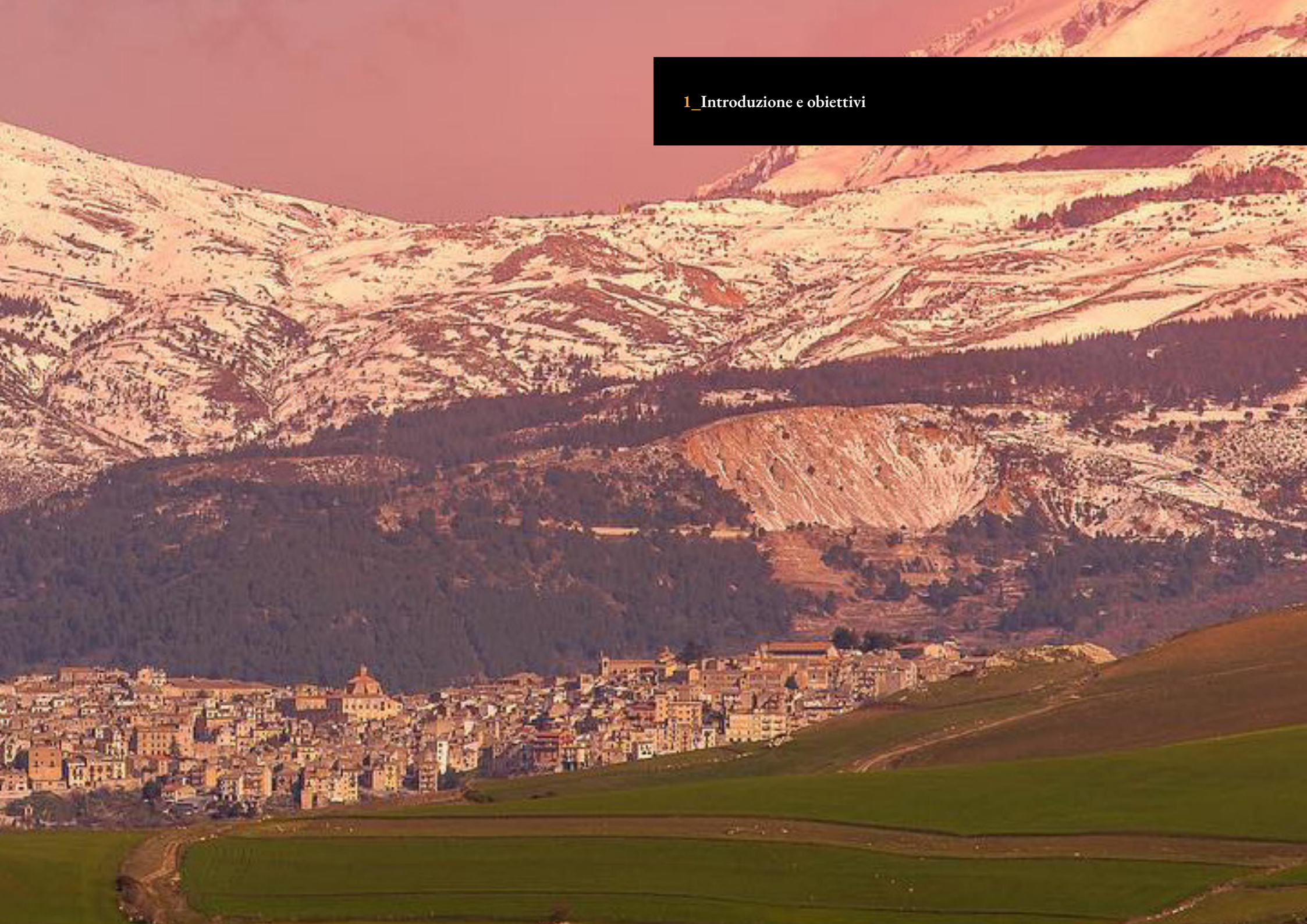
Polizzi Generosa; ©Michele Tumminello, 2022

1_Introduzione e obiettivi



Polizzi Generosa; ©Michele Tumminello, 2022

Polizzi da una torre; ©Luisa Lombardo 2024

Introduzione

Che cos'è un paese? Un paese è, prima di tutto, la sua storia: il racconto del tempo che si riflette nell'urbanistica, nell'architettura, nelle strade e nelle piazze. È il tessuto fatto di case, servizi, alberi, colori, pietre, balconi e portoni, che ne definiscono l'identità fisica. Ma, soprattutto, un paese è la sua gente: le persone che lo abitano, lo vivono e lo animano, custodendo e tramandando tradizioni, ricordi e quotidianità, dando senso e vita a ogni suo elemento.

Le linee guida che il lettore ha tra le mani si riferiscono ai contesti dei paesi del Parco delle Madonie, luoghi ricchi di architettura, storia, cultura e tradizioni millenarie.

In particolare, il caso studio di Polizzi Generosa è stato scelto per il suo significato all'interno della Convenzione vigente con il Dipartimento di Architettura, con il S.S.D. CEAR-08/A - Architettura Tecnica, della tesi dottorale dell'Autore dal titolo "Centri minori intelligenti nel Parco delle Madonie in Sicilia.

Strategie di recupero e valorizzazione delle aree interne", finanziata dall'INPS e in collaborazione con la Soprintendenza BB.CC.AA. della Provincia di Palermo, la Real Academia de Bellas Artes de San Carlos de Valencia e l'Universitat Politècnica de València.

Il patrimonio culturale del nostro Paese, e in particolare dei piccoli centri come quelli del Parco delle Madonie, deve essere recuperato e valorizzato per tutelare l'identità dei luoghi storici, portarli a una condizione di contemporaneità e garantirne la trasmissione alle generazioni future.

Il Parco delle Madonie

Incastonato al centro della Sicilia e al Centro del Mediterraneo, il grande Parco delle Madonie, istituito nel 1989, riconosciuto come Geopark nel 2004 e UNESCO Geopark nel 2015 ha una superficie di circa 40.000 ettari. È il secondo parco siciliano più grande per estensione ed è situato nella parte settentrionale dell'isola, all'interno della Provincia di Palermo. Rappresenta uno dei più celebri ecosistemi montani del bacino del Mediterraneo per la ricchezza della sua flora e l'interesse considerevole della sua vegetazione (Farinella, 2010).

Comprende, oltre il comune di Polizzi Generosa, oggetto di studio e di analisi delle presenti linee guida, altri 20 comuni siciliani che si snodano dal comune di Cefalù verso l'interno dell'isola, spingendosi quasi fino alla provincia di Enna. Comuni, molti dei quali fondati dagli arabi e dai normanni per difendere l'entroterra, che offrono uno scorcio quasi intatto degli antichi paesi tradizionali della Sicilia (Anselmo, 2016).

La vetta più alta del Parco è Pizzo Carbonara con i suoi 1.979 metri: la seconda montagna più alta dell'isola. In questo complesso montuoso ci sono mete sciistiche come Piano Battaglia, ma ad arricchire questo straordinario territorio sono anche i tanti beni isolati come masserie, pagliai, abbeveratori, pozzi e sorgenti termali, complessi termali, vecchi rifugi montani e punti panoramici da cui osservare il panorama e il Mar Tirreno, beni anch'essi parte integrante del paesaggio, meritevoli, in egual maniera, di tutela e valorizzazione (Salamone Cristodaro, 1987).

I boschi delle Madonie sono tra i più variegati del Mediterraneo con faggi, olmi, lecci, querce da sughero e agrifogli. In queste zone è presente una nicchia ecologica e un numero elevato di piante endemiche e specie arboree che crescono solo in questo territorio, uniche al mondo. In quanto a fauna sono presenti oltre la metà delle specie di uccelli, tutte le specie di mammiferi e più della metà delle specie di invertebrati siciliane (Gennuso, 2019).

Numerosi sentieri permettono, inoltre, di esplorare a piedi, a cavallo o in bicicletta, il Parco, come le antiche regge trazzere, strade a fondo naturale utilizzate per il trasferimento degli armenti dai pascoli invernali delle pianure ai pascoli estivi delle montagne. Alcuni di essi si snodano tra boschi, vallate, altopiani e colline, e permettono di scoprire le meraviglie nascoste del Parco: specie arboree rare (tra cui l'Abies Nebrodensis, un albero aghiforme quasi estinto presente tra Polizzi Generosa e Petralia Sottana), ma anche sorgenti, cascatelle, boschi, laghetti di montagna oggi mantenuti in vita dagli addetti alla cura e alla manutenzione del Parco (Macaluso, 2022).

Il Parco è gestito dall' "Ente Parco delle Madonie", ente di diritto pubblico, e sottoposto a controllo e vigilanza della Regione siciliana, con sede a Petralia Sottana. Diversamente dal resto della Sicilia, gli inverni sono rigidi con temperature in alcuni casi inferiori a -10°C, mentre le estati sono piuttosto calde ma non afose. Le temperature medie massime annuali delle zone interne, pur variando da un'area all'altra, generalmente si mantengono fra 11 e 12 °C nella media. Sono presenti anche fenomeni come la nebbia e la neve, quest'ultima si può trovare anche in estate all'interno di alcune doline chiamate "neviere", sopra i 1800 metri (Lavanco, 2019).

Sulle Madonie, oltre ad un contesto naturalistico ben conservato, all'interno dei piccoli paesi c'è anche una ottima cultura eno-gastronomica che si è sviluppata per i numerosi prodotti tipici della zona (Abbate, 1997). Alcuni, oggi, sono diventati Presidio Slow Food come i Fagioli a badda e i Pipi di Polizzi, le Albicocche di Scillato, la Provola e la Manna delle Madonie. È ancora molto diffusa la pastorizia e si producono formaggi di pecora e di capra. Sopravvivono le antiche forme di artigianato locale e la produzione della ceramica e della maiolica (Anselmo, 2021).

In quasi tutti i paesi del Parco le festività religiose sono molto sentite e osservate, feste tradizionali di paese cui si affiancano le numerose sagre dei prodotti tipici. Tra questi, il contesto di Polizzi Generosa, borgo immerso nel grande polmone verde delle Madonie, che le Linee Guida intendono esaminare nel dettaglio (Curatolo, 2019).

Parco delle Madonie; ©Carmelo Di Salvo, 2022

Confine Comune di Palermo

Area delle Madonie

Confine dell'area delle Madonie

Comuni dell'area delle Madonie

Comune di Polizzi Generosa

Confine dell'area delle Madonie

Parco delle Madonie

Comune di Polizzi Generosa

Polizzi Generosa

Il Comune di Polizzi Generosa è un'area interna rurale, secondo Diodoro Siculo, è l'Atene siciliana, mentre per Arezio, Auria e Pirri, storici del passato, il nome del paese deriva dagli dei Palici (Salamone Cristodaro, 1987).

Secondo Maurolico, invece, la città sarebbe stata fondata dai sopravvissuti di Palica dopo la sconfitta di Ducezio, che aveva guidato le genti sicule contro le colonie greche.

Il ritrovamento a Polizzi di una statua triforme di Iside, andata distrutta, infondò l'opinione comune che il nome volesse significare Città di Iside. Il recente ritrovamento in contrada S. Pietro, nel 1992, di una necropoli databile al IV - III secolo A.C., e prima ancora, in via Carlo V nel 1938, di monete e oggetti di terracotta, della stessa epoca, documentano, invece, la presenza di insediamenti abitativi fin dall'epoca ellenistica, e contatti con il mondo cartaginese (Farinella, 2010).

Il primo insediamento storico dell'odierna Polizzi risalirebbe al IV secolo a.C., ma il nucleo attuale della cittadina si sviluppò durante il periodo della dominazione bizantina e ricevette il nome di Baseapolis, Città del Re. Nel 882 subì anche la dominazione araba e ne rimase sotto il dominio fino al 1082.

In epoca normanna il conte Ruggiero fece fortificare la Rocca ed il Castello; la nipote, contessa Adelasia, Signora di Polizzi, diede grande impulso al paese, che si estese notevolmente, ospitando in pacifica convivenza diverse etnie quali bizantini o greci, arabi, latini ed ebrei (Salamone Cristodaro, 1987).

La conquista delle Madonie da parte dei Normanni, nel 1071, segnò l'avvio di un periodo di grande sviluppo e prosperità per Polizzi e Federico II le concesse, nel 1234, il titolo di Generosa in onore dell'ottima accoglienza ricevuta e della ricchezza del suo territorio; da allora è rimasto come parte integrante del nome. Nello stesso periodo furono fortificati il castello, già esistente sulla Rocca, e se ne edificò uno nuovo in contrada Campo, zona strategica per il controllo dei due versanti dell'Imera Settentrionale e Meridionale, la più importante via d'accesso verso l'interno dell'isola. Salvo brevi periodi, fu sempre città demaniale e difese sempre gelosamente la propria indipendenza (Gennuso, 2019).

Entro al sito e mura della Città di Polizzi vi erano sei quartieri o, come anticamente denominate, 6 capitanee che prendono il nome di sei antiche chiese polizzane: Quartiere di Santa Maria Maggiore; Quartiere di San Nicolò Dè Franchis; Quartiere di San Brancato; Quartiere di San Giorgio; Quartiere di San Blasi; Quartiere della Maddalena; Fuori dalle mura della città, erano situate, invece, la Chiesa e il Convento del Carmine (Salamone Cristodaro, 1987). Il paese aveva un proprio governo e proprie leggi, ancora oggi degne di ammirazione per la loro equità.

I più importanti privilegi legati all'essere Città Demaniale furono l'impianto della corte di prima appellazione, l'esenzione dai donativi regi, la franchigia per i suoi abitanti del diritto di gabella della dogana per tutto il Regno di Sicilia e la facoltà che le cariche pubbliche elette per scrutinio appartenessero ad abitanti della Città, che aveva propri rappresentanti nel Parlamento Siciliano.

Le città demaniali avevano, infatti, privilegi e prerogative importanti, e per questo motivo numerose famiglie benestanti definite "nobiles" pur non essendolo, poiché la nobiltà veniva conferita con privilegio regale, in virtù dello loro ricchezza, costruirono bellissime e sontuose dimore, ottenendo dal vicerè di attribuirsi uno stemma ereditabile. Fu spesso luogo di soggiorno di Principi e Sovrani; la contessa Adelasio, il nipote di Ruggero, la regina Elisabetta d'Aragona, il figlio Ludovico, re di Trinacria, la regina Maria, moglie di Martino il Giovane, la regina Bianca di Navarra, vicaria del Regno di Sicilia, e l'imperatore Carlo V, che nel 1535, di ritorno da Tunisi, fu ospite di Gian Bartolo La Farina, istituendo in quella occasione il Senato cittadino (Albanese, 2018).

Nel 1282 Polizzi Generosa collaborò alla cacciata degli Angioini ed all'insediamento degli Aragonesi, partecipando ai Vespri Siciliani, e dando il proprio apporto in termini di truppe e viveri (Lavanco, 2019). Già nel XIV secolo il paese non solo possedeva leggi proprie, ma la suddetta legislatura si distingueva dalle altre, suscitando ammirazione per i principi di giustizia ed equità da cui era ispirata. Mentre nel resto dell'isola si assisteva al progressivo diffondersi dell'anarchia feudale, Polizzi, per la fama e l'importanza che ormai aveva raggiunto, fu contesa tra i Chiaramonte ed i Ventimiglia.

Questi ultimi nel 1354 ebbero la meglio e la reintegrarono al demanio regio (Macaluso, 2022). Questi ultimi nel 1354 ebbero la meglio e la reintegrarono al demanio regio. Prima Filippo e poi Francesco Ventimiglia se ne assicurarono il comple-

to dominio, sfruttando l'agitazione che interessava il governo indebolito dalle lotte tra i nobili. La fine delle rivalità all'interno della nobiltà ed il ritorno all'ordine si ebbero solo con l'arrivo di Martino il Giovane, verso il quale la città si dichiarò vassalla, perdendo per sempre la propria indipendenza (Gennuso, 2019).

La guerra la indebolì al punto che la città fu costretta ad indebitarsi per restare fedele alla corona e fu proprio per far fronte a questi nuovi sopraggiunti debiti, che il suo territorio venne ceduto al feudatario Raimondo Caprera (Macaluso, 2022). Il popolo si unì allora nella comune e ferrea volontà di riscattare la propria libertà e riuscì a raccogliere lo considerevole somma di 10.000 fiorini da versare nelle casse regie per annullare l'atto di compravendita (Curatolo, 2019). Per questo motivo, nel 1442, il re Alfonso di Aragona tolse la città a Raimondo Caprera e la restituì al demanio, stabilendo inoltre, il 20 aprile 1445, che non poteva mai più essere venduta e che da quel momento nessun regnante avrebbe potuto staccarla dal Regio Demanio. Si trattava di un diritto irrevocabile spettante al popolo di Polizzi, da difendere, anche con le armi, in nome dello stesso re (Anselmo, 2021).

Il periodo di maggiore splendore fu quello rinascimentale: era il nodo principale di un sistema viario notevolissimo per l'epoca, le due regie trazzere, la "Messina Montagne" e la "Montagna-Marine", i più importanti collegamenti tra Palermo, Messina e la zona di Licata. Lungo i due rami del fiume Imera, Imera settentrionale, o Fiume Grande, e Imera meridionale, con grandi vallate, coltivate a cereali e frumento, correva la "via del grano", che veniva convogliato per esportarlo ai grandi caricatori di Termini e Roccella da un lato, e Licata dall'altro (Salamone Cristodaro, 1987). Enormi erano gli interessi economici lungo questa strada, e quindi fissare la propria dimora a Polizzi, accaparrarsi i feudi lungo i corsi di questi fiumi e controllarne i commerci e i dazi, significava dominare la via del grano tra la costa settentrionale e meridionale della Sicilia (Farinella, 2010).

La presenza di molte famiglie nobili e la legge del maggiorasco, con la conseguente monacazione dei figli cadetti, fecero sì che a Polizzi fossero presenti tutti gli ordini religiosi e che il paese si arricchisse di chiese e conventi pieni di opere d'arte. La vita culturale era particolarmente fervida, la prima scuola pubblica fu aperta nel 1428, il primo acquedotto per l'erogazione gratuita dell'acqua a tutti gli abitanti fu costruito nel 1470 (Macaluso, 2022). Grazie a questi splendidi sussidi che avevano fornito ai cittadini il necessario per una vita dignitosa ed il progresso dei loro beni spirituali, Polizzi conobbe un periodo di inaspettata fortuna.

Natura e architettura; ©Luisa Lombardo, 2024

Polizzi Generosa; ©Michele Tumminello, 2022

Le linee guida mettono a disposizione di amministrazioni, tecnici, imprese, associazioni e cittadini dei paesi del Parco delle Madonie e, più nello specifico, del Comune di Polizzi Generosa una serie di strategie virtuose volte all'elaborazione dei progetti di recupero o di opera nuova costruzione in accordo alle peculiarità costruttive dell'area, ma soprattutto al Regolamento Edilizio del Comune e al Piano Paesaggistico Territoriale vigenti.

Il Piano Paesaggistico della Provincia di Palermo, in corso di pubblicazione, che segue il Codice dei Beni Culturali e del Paesaggio - CBCP (DLgs. 42/2004), ha il compito e il dovere di preservare il valore del patrimonio costruito e naturalistico della Provincia di Palermo, del Parco delle Madonie e di tutti i comuni insistenti nell'area. I relativi vincoli presenti nell'area sono molteplici, primo tra tutti il Vincolo Paesaggistico, responsabile di un livello molto alto di protezione e di una serie di interventi contenuti nel D.P.R. 31/2017[2].

Oltre al Vincolo Paesaggistico, un limite previsto dalla legislazione italiana su terreni o immobili di particolare valore storico, ambientale o culturale, nell'area, è presente anche quello Archeologico, volto a tutelare i beni riconosciuti di interesse archeologico. Nell'area di Polizzi Generosa, questo insiste sull'area del castello e sulle abitazioni limitrofe.

Tale vincolo impone, ad ogni modifica o progetto da presentare, una valutazione preventiva attraverso scavi volti alla verifica della presenza di reperti archeologici o meno e alla presentazione di un progetto che non comprometta i reperti archeologici presenti.

Polizzi Generosa, ad oggi, presenta un'immagine variopinta del comparto edilizio, un'edilizia ben conservata nelle sue storiche tecniche costruttive, ma degradata e che, dunque, necessita di un adeguato programma per riportarla ad una condizione di contemporeneità. Camminando per le strade è possibile scorgere progetti di recupero più o meno fortunati e lo stesso potrebbe dirsi per progetti di nuova edificazione realizzati in sostituzione dell'esistente che, il più delle volte, non rispettano i caratteri identitari locali.

Le linee guida vogliono rappresentare un documento utile a comprendere le strategie più efficaci preservando e conservando la storicità dell'architettura e dei luoghi. Un manifesto delle tecniche costruttive tradizionali per attivare buone pratiche di recupero edilizio. L'elaborato proposto, tuttavia, non costituisce un insieme di norme, piuttosto una guida e un insieme di buone pratiche da utilizzare come allegato del Regolamento Edilizio[1] (RE), per la comprensione del patrimonio esistente e la conseguente redazione di progetti compatibili con il patrimonio costruito, facilitando l'applicazione della normativa vigente.

L'obiettivo del lavoro è unificare i criteri di recupero e valorizzare il Comune di Polizzi per delineare un modo nuovo di riabilitare la Città, avendo come base la conoscenza delle tecniche costruttive storiche, il lessico costruttivo e la matrice tipologico-funzionale del patrimonio definito "minore" e le possibilità di intervento validate e stabilite ex ante in sinergia con la Soprintendenza BB.CC.AA. di Palermo.

[1]In Sicilia, a seguito della recente approvazione del Decreto del Presidente della Regione Siciliana del 20 maggio 2022, n. 531, nasce il nuovo Regolamento Edilizio tipo regionale. Il RE, pur rimanendo funzionalmente connesso allo strumento urbanistico comunale, ha però un proprio iter procedurale di formazione ed approvazione, sganciato da quello del Piano.

In riferimento ai documenti tecnici che possono essere allegati al R.E, vengoino fornite delle indicazioni sui possibili approfondimenti operativi, quali:

- indirizzi per la qualità paesaggistica degli insediamenti;
- criteri per l'intervento sul costruito storico;
- obiettivi prestazionali per la salute e la sostenibilità dell'ambiente costruito, per l'utilizzo razionale delle risorse energetiche e delle risorse idriche;
- obiettivi per il miglioramento dell'efficienza energetica del sistema edificio-impianti; per l'utilizzo di fonti rinnovabili di energia, per l'utilizzo di materiali biocompatibili ed eco-compatibili, per la cura e manutenzione programmata del patrimonio edilizio;
- schede tecniche di qualità dei materiali e delle tecnologie costruttive.

[2]Il D.P.R. 31/2017, nei suoi Allegati A e B, contiene il procedimento autorizzatorio degli interventi ed opere di lieve entità con o meno autorizzazione paesaggistica.

Panoramica Parco delle Madonie; ©Carmelo Di Salvo, 2022

I criteri unificatori dettati dalle linee guida sono volti alla riduzione dei ricorsi compositivi e progettuali liberi ed aiutano a restituire un'immagine pubblica del Comune decorosa attraverso la corretta riqualificazione dei prospetti, delle coperture, ma non solo, anche dell'intero comparto urbano.

Le linee guida si propongono di trovare soluzioni adeguate per il patrimonio architettonico nel suo complesso, considerando il "borgo" come un unicum in cui ambiente e costruito si fondano restituendo un'immagine armoniosa di natura e artificio. Per tale motivo, si ricorrerà, molto spesso, alla comparazione tra esempi positivi e negativi del patrimonio esistente come metodo efficace per consentire la valitazione in situ di ciò che va bene e ciò che non è opportuno, e, dunque, dove è doveroso intervenire.

Persegue, infine, l'obiettivo ultimo della terza missione: la disseminazione delle conoscenze acquisite nella Ricerca universitaria e il loro impiego sinergico, avendo come punto di riferimento e obiettivo primario l'interesse dell'istituzione e della comunità universitaria nel suo insieme, nonché quello della società civile nel suo complesso, in ultimo, mantenere un'immagine del Comune di Polizzi Generosa che potenzia i suoi valori di città storica.

Nelle pagine seguenti si raccolgono, in maniera sistematica, la tradizione costruttiva locale, il piano di tutela del territorio volto alla salvaguardia e al recupero del patrimonio costruito, la valutazione della vulnerabilità del costruito storico ed alcune raccomandazioni che esulano da quanto normato dal RE o dal CBCP, semplici raccomandazioni utili a migliorare l'espatto del paese.

La semplicità delle linee guida è volta a mettere insieme le ricerche pregresse sviluppate nell'area ed a sintetizzare le informazioni raccolte negli ultimi anni fornendo risposte immediate ai problemi concreti riscontrati nel territorio. Di facile utilizzo e accessibile a tutti, con proposte progettuali chiare e senza ricorrere ad una terminologia eccessivamente tecnica. Laddove non risulta possibile utilizzare termini facilmente comprensibili, a chiusura delle Linee Guida, è stato creato un glossario per una interpretazione immediata ed a portata di tutti.

Queste linee guida vogliono trovare soluzioni adeguate che permettano il recupero dell'edilizia tradizionale esistente, senza rinunciare alle caratteristiche identitarie locali come la compattezza dei volumi e i caratteri tipologici e costruttivi delle cellule residenziali, elaborate e tramandate dalle maestranze locali, di generazione in generazione.

La metodologia utilizzata per l'ambito urbano in esame, può essere trasposta in altri contesti territoriali madoniti, ma non solo, al fine di tutelare i beni architettonici, quali i borghi, arricchiti da una cultura millenaria che ha radici lontane e che non bisogna, in alcun modo, dimenticare o, peggio ancora, perdere. Le Linee Guida si presentano come un'occasione di conoscenza dei luoghi, delle architetture e delle peculiarità tecnico-costruttive presenti nell'area attraverso la comprensione visiva dei manufatti architettonici, pertanto, per una maggiore conoscenza e comprensione tecnica si consiglia la consultazione e l'approfondimento delle tematiche affrontate come testi suggeriti in bibliografia e nelle note presenti nel testo.

Devotion; ©Luisa Lombardo, 2022

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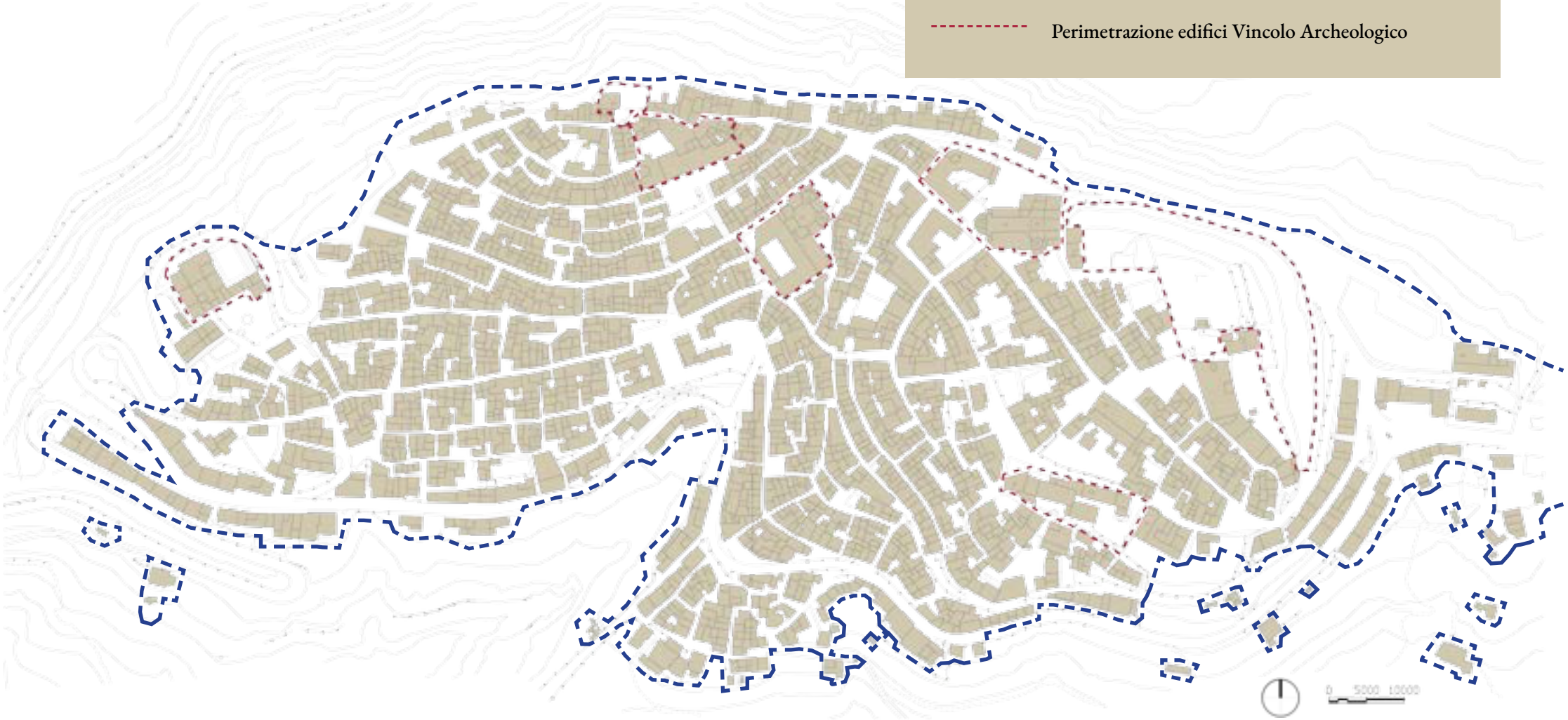
Polizzi Generosa from above; ©Carmelo Di Salvo, 2022

2_L’architettura di base di Polizzi Generosa



Elaborazione del P.R.G. di Polizzi Generosa e dei vincoli insistenti dell'ambito urbano; ©Luisa Lombardo, 2023

Polizzi Generosa da Google Earth; ©Google Earth, 2023

Su un'alta rupe che si estende lungo le pendici meridionali del Parco delle Madonie e che domina l'alta valle dell'Imera Settentrionale si impone il Comune di Polizzi Generosa, uno dei ventuno comuni del comprensorio madonita.

Borgo che segue la particolare conformazione orografica del territorio caratterizzata da un'edilizia di base con complessi abitativi a media-alta densità. Isolati densi separati da stretti vicoli tortuosi, lunghe scalinate, cordonate, piazze e slarghi in cui principio dell'arroccamento è fortemente presente.

La tipicità dell'area incide fortemente sull'architettura locale con materiali quali calcarenite, gesso e legno che, insieme, determinano volumi delle architetture molto compatti e caratteri tipologici-costruttivi delle cellule residenziali con risultati tecnici e formali unici al mondo.

L'edilizia di base è condizionata anche dal clima (zona climatica D), dai materiali da costruzione e dalle tecniche costruttive adoperate nel corso del tempo dipendenti sia dalle risorse locali (le cave limitrofe) e dalla limitatezza dei mezzi tecnici ed economici che dalla difficoltà dei collegamenti e dei trasporti.

Di seguito si ricorre alla disamina delle caratteristiche architettoniche presenti per macrofamiglia, dall'involucro edilizio fino all'analisi delle unità abitative e delle partizioni interne.

Chiasso Fatta; ©Luisa Lombardo, 2023

Lo sviluppo delle unità abitative dell'intero borgo segue un'impostazione prevalentemente "a schiera", con edifici costruiti in aderenza lungo le strade principali, interrotti da slarghi e vicoli ciechi che fungono da spazi aperti comuni per il vicinato. Questi spazi, pur nella loro semplicità, hanno sempre avuto una funzione essenziale, offrendo luoghi di socialità e consentendo lo svolgimento di molte attività quotidiane, soprattutto nei periodi più caldi dell'anno, quando gli interni delle abitazioni risultavano meno confortevoli.

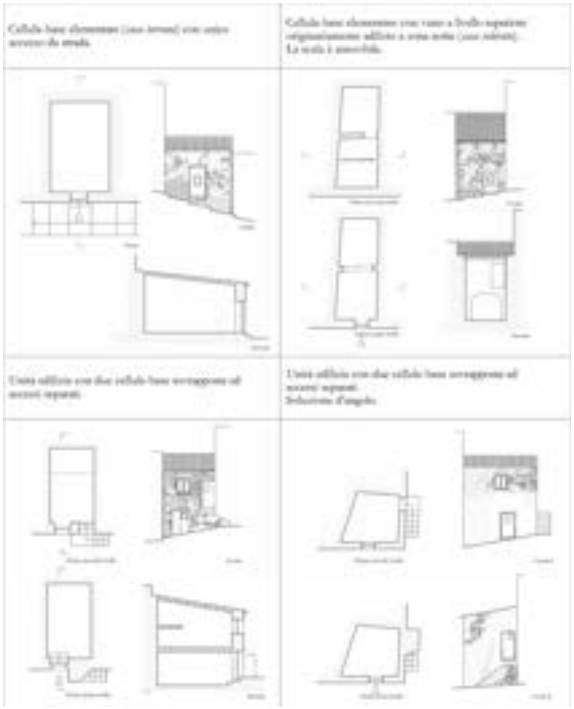
In alcuni casi, l'aggregazione "a schiera" si sviluppa in modalità "doppia" o "a spina", caratterizzata dalla presenza di unità abitative con un solo lato libero. Queste abitazioni si trovano in aderenza non solo con le unità laterali ma anche con quelle retrostanti, seguendo la conformazione del terreno e disponendosi lungo la massima pendenza. Questa configurazione ottimizza l'uso dello spazio, rispettando le caratteristiche morfologiche e orografiche del territorio.

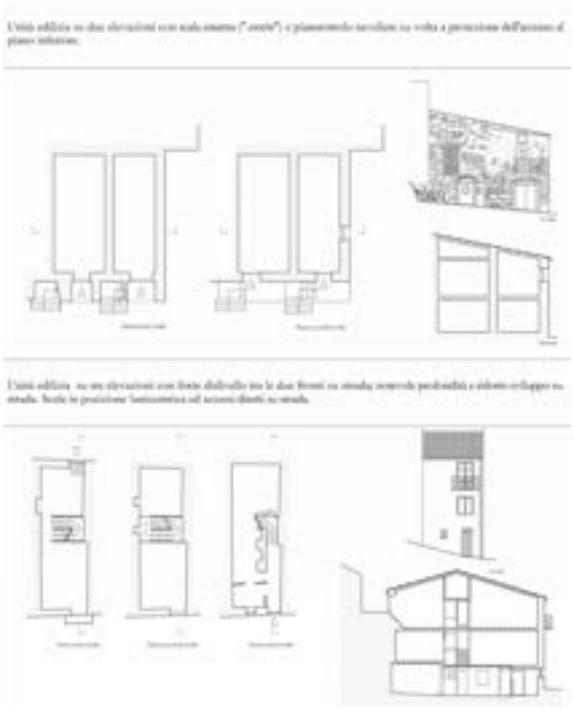
Le abitazioni riflettono sempre l'andamento naturale del terreno e delle strade circostanti, con uno sviluppo che mantiene un'affinità tra le costruzioni e l'ambiente urbano. Solitamente, le case hanno un solo affaccio su strada e sono dotate di un corpo di fabbrica doppio, mentre gli esempi di abitazioni isolate risultano piuttosto rari. In questi casi, il doppio affaccio è generalmente limitato ai piani superiori, con accessi su strade a diversa quota e una marcata verticalità delle facciate, soprattutto nel lato rivolto a valle. L'orientamento delle abitazioni privilegia l'asse nord-sud, che permette un'illuminazione naturale ottimale: le facciate est si riscaldano con i primi raggi del sole mattutino, mentre quelle ovest beneficiano della luce pomeridiana. Nei casi in cui la conformazione del terreno obbligava a un orientamento est-ovest, si adottava la tipologia di casa "a schiera singola" per garantire l'irraggiamento solare delle facciate esposte a sud.

Nonostante queste regole di aggregazione urbana, è possibile osservare anche esempi di organizzazione più spontanea. Questi casi di aggregazione casuale si contraddistinguono per una configurazione plano-altimetrica particolarmente articolata, con profondità e altezze variabili, geometrie in pianta irregolari e volumi alternati. In tali contesti, i vuoti urbani – come passaggi coperti, cortili, vicoli e slarghi – giocano un ruolo fondamentale, non solo come elementi di alleggerimento del tessuto costruito ma anche come spazi di transizione e mitigazione climatica. Essi offrono zone ombreggiate durante l'estate e protezione dalle correnti fredde nei mesi invernali.

Una tipologia abitativa largamente diffusa è la "terrana", una casa ad un unico livello che rappresenta la cellula residenziale più semplice. Di dimensioni contenute, con una larghezza media di 5 metri e una profondità di 6-7 metri, questa tipologia prevede un unico affaccio su strada, che funge sia da punto di accesso che da fonte principale di illuminazione e ventilazione. Oltre alla funzione abitativa, la terrana era spesso utilizzata come deposito o ricovero per gli animali, svolgendo un ruolo essenziale nella vita quotidiana di chi abitava il borgo.

L'evoluzione della terrana ha dato origine alla





casa "solerata", un'abitazione a due livelli caratterizzata dalla presenza di un soppalco ligneo, accessibile tramite una scala a pioli.

Questo spazio, posto a ridosso della parete di fondo, serviva da piano superiore, ma l'abitazione risultava spesso poco adatta alla vita quotidiana a causa della scarsa ventilazione e illuminazione, rendendola più funzionale come stalla o magazzino. Nelle strade con forte pendenza, si adottava una scala esterna in muratura, detta "*annìto*", parallela al prospetto principale.

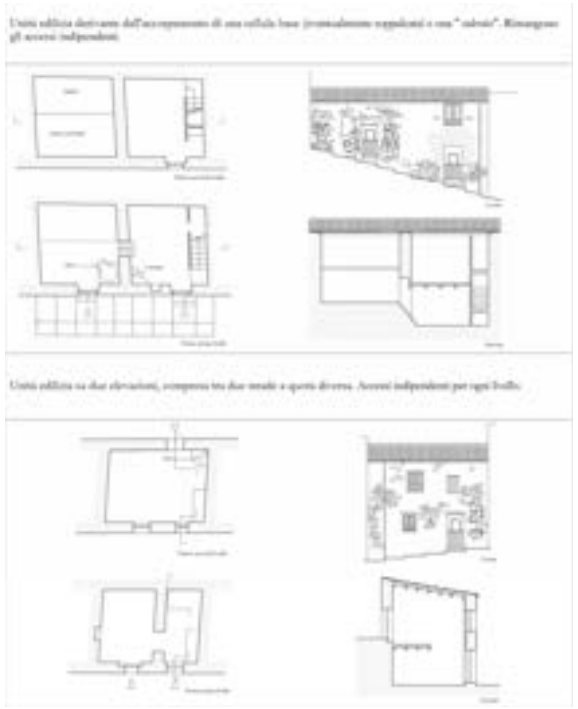
Questa soluzione architettonica prevedeva un pianerottolo coperto e fungeva da spazio privato all'aperto nei contesti in cui mancavano cortili o slarghi.

A partire da queste tipologie base, si sono sviluppate configurazioni più complesse attraverso l'unione e la sovrapposizione di due o più unità abitative.

Tale fusione permetteva di diversificare le funzioni: una parte dell'abitazione veniva destinata a magazzino, mentre l'altra comprendeva una cucina al piano terra e una camera al piano superiore. Le

Edifici a faccia vista e intonacati a Polizzi; ©Luisa Lombardo, 2023

Via Roma a Polizzi; ©Luisa Lombardo, 2023



case su tre livelli, invece, seguivano una suddivisione spaziale più definita, con il piano terra destinato ad attività non residenziali, il piano intermedio alla zona notte e l'ultimo piano alla cucina, che spesso godeva di una migliore illuminazione naturale.

Le abitazioni di proprietà della borghesia emergente presentavano caratteristiche più elaborate, come i "palazzetti" a tre piani.

Questi edifici erano dotati di un accesso unico, evidenziato da portali decorati, e una scala centrale che conduceva ai vari ambienti, con le zone di servizio al piano terreno. I prospetti erano spesso arricchiti da elementi ornamentali, come balconi, cornicioni e portali, realizzati con materiali di pregio.

Infine, le case di testata, collocate agli angoli o alle estremità delle file edilizie, si distinguevano per la loro configurazione architettonica unica, caratterizzata da accessi disposti asimmetricamente, scale esterne e pareti spesso prive di aperture.

Queste varianti dimostrano la capacità delle comunità locali di adattare l'architettura alle esigenze funzionali e alle peculiarità del contesto territoriale.

Scorci a Polizzi; ©Luisa Lombardo, 2023

Un rudere a Polizzi Generosa; ©Luisa Lombardo, 2023

Materiali e Tecniche costruttive

Apparecchi murari

L'economia ha sempre rappresentato un principio fondamentale nell'edilizia minore, influenzando profondamente la scelta dei materiali da costruzione. La possibilità di utilizzare risorse disponibili nelle immediate vicinanze o provenienti da cave situate a breve distanza dall'abitato era spesso considerata indispensabile.

Questo approccio si rivelava ancor più necessario nelle aree con caratteristiche orografiche complesse, dove il trasporto di materiali risultava particolarmente arduo o addirittura impraticabile. Inoltre, la difficoltà nel trasporto determinava anche il formato degli elementi edilizi: quando le cave si trovavano lontano, si privilegiava l'estrazione di blocchi di dimensioni ridotte, più semplici da trasportare.

Il fatto che molte costruzioni minori presentino murature a vista può essere attribuito a diversi fattori, come la scarsità di risorse, scelte estetiche deliberate o la mancanza di manutenzione che, in alcuni casi, ha lasciato esposte le strutture abbandonate. Questa condizione offre l'opportunità di analizzare nel dettaglio la composizione verticale portante degli edifici, prendendo in esame le varie componenti: elementi costruttivi fondamentali, spessori, tipologie di muratura, eventuali indentature, connessioni, diatoni, ortostati, caratteristiche dei nuclei interni e la presenza di elementi in legno o metallo, che svolgono funzioni complementari nella stabilità e organizzazione dei setti murari.

Le murature possono variare da soluzioni più semplici, caratterizzate dall'uso di pietre appena sbozzate o grandi ciottoli fluviali, impiegati soprattutto per i paramenti esterni e per il riempimento interno con conglomerati, fino a configurazioni più elaborate, in cui si adotta una tessitura mista composta da pietra locale finemente lavorata e laterizio.

In numerosi esempi di murature, i blocchi impiegati – prevalentemente in pietra calcarea compatta o quarzareniti con buona cementazione calcarea – mostrano dimensioni differenti tra il piano terra e i piani superiori. Anche lo spessore delle pareti varia: alla base si aggira intorno ai 70-80 cm, mentre nei piani superiori si riduce a 30-45 cm.

Quando la pietra disponibile risultava particolarmente compatta, per ragioni economiche e per la difficoltà di lavorazione, era comune utilizzare pietrame informe appena sbozzato su due facce. In questi casi, i blocchi più lunghi, detti diatoni, erano poco frequenti e si inserivano nel setto murario per una profondità che raramente superava i 2/3 dello spessore totale.

L'impiego di pietrame minuto, spesso derivante da scarti di cava, residui di lavorazione o materiali di recupero provenienti da demolizioni, era una pratica diffusa nei cantieri edili più modesti. Questo materiale veniva utilizzato in modo spesso casuale e disordinato per realizzare nuclei di murature di varia estensione, caratterizzati da una forte eterogeneità dei componenti.

Si possono inoltre osservare murature listate, in cui la pietra compatta informe veniva intervallata a intervalli regolari inferiori al metro con fasce di ripianatura ("*arasature*"). Un'altra tipologia ricorrente è rappresentata da murature in cui conci

squadrati si alternano, sia sul paramento che in sezione, a pietrame informe posto in opera con l'uso di malta.

Sono stati individuati alcuni esempi di murature realizzate con conci squadrati, accuratamente lavorati per consentire una disposizione isodoma. I blocchi venivano posati su letti di malta con giunti sottili e sfalsati, arricchiti spesso da precise rinzeppature. Queste ultime erano ottenute inserendo nei giunti frammenti di pietra, piccoli cocci ("*rimbottonature*") o pezzi di mattoni ("*pezzotti*"). Oltre a svolgere una funzione strutturale, tale tecnica conferiva una certa eleganza estetica alla facciata, grazie all'alternanza cromatica dei materiali, creando un motivo decorativo originale.

Si prestava particolare attenzione a evitare discontinuità tra i setti murari di unità edilizie differenti. Nelle costruzioni realizzate per prime, è possibile osservare l'inserimento di conci lapidei progettati come indentature, destinati a integrarsi con le murature degli edifici adiacenti costruiti successivamente. Questo accorgimento garantiva una continuità non solo formale ma, soprattutto, strutturale tra le diverse murature, rafforzando l'integrità complessiva del complesso edilizio.

In alcune zone del territorio montano, l'abbondanza di argilla e la presenza di fornaci per la cottura favorivano l'impiego del laterizio, che era comunemente utilizzato come elemento costruttivo per le murature.

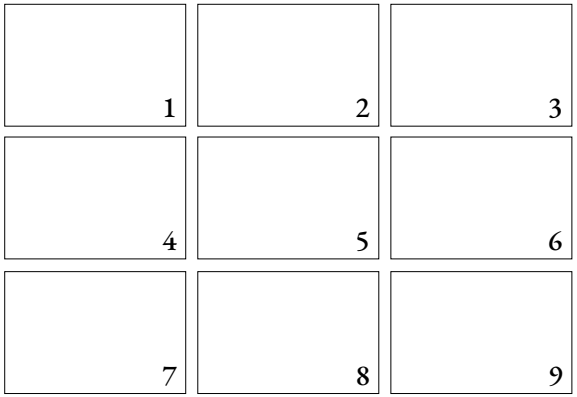
Il mattone veniva impiegato per conformare le murature secondo le configurazioni tipiche descritte nella manualistica, lasciando spesso al piano terra il ruolo predominante alla pietra compatta, più resistente al degrado. La disposizione dei mattoni, alternati in filari piani con ortostati e diatoni, e talvolta intervallati da listature decorative in cui i mattoni erano disposti "*a coltello*" contribuiva a creare semplici ma efficaci motivi ornamentali, ampiamente diffusi in determinate aree.

In alcuni casi, l'uso del mattone nelle murature distingue chiaramente i volumi originari dalle sopraelevazioni realizzate in periodi successivi, oppure segna le ricostruzioni di porzioni di muro crollate o gravemente danneggiate. In tali situazioni, è frequente trovare nei piani superiori sezioni più sottili o l'impiego di mattoni forati, che cominciavano ad essere utilizzati già verso la fine del XIX secolo.

ABACO FOTOGRAFICO DEGLI APPARECCHI MURARI

1. Apparecchio murario costituito da due differenti murature; in corrispondenza della porzione basamentale vi è una muratura in pietrame informe di varia dimensione, mentre la restante muratura è costituita da mattoni pieni disposti di piatto a filari alternati a costruire ora ortostati, ora diatoni.
2. Muratura con mattoni posti di piatto.
3. Rincocciatura in piccoli pezzi di laterizio.
4. Muratura con pietrame informe a diversa pezzatura.
5. Muratura parzialmente sbozzata con rinzeppatura dei giunti con mattoni rotti.
6. Muratura isodoma e giunti sottili.
7. Muratura costituita da pietrame informe e diversa pezzatura.
8. Muratura costituita da pietrame informe e diversa pezzatura.
9. Muratura costituita da pietrame informe di varia pezzatura con disposizione pseudo ordinata su ricordi orizzontali realizzati in lastre di pietra a spacco.

Foto di Luisa Lombardo



Cantonale Palazzo Gagliardo; ©Luisa Lombardo, 2023

Particolare attenzione veniva prestata alle soluzioni angolari. I cantonali, noti anche come porzioni di girata o pilastri di fabbrica, evidenziavano una differente conformazione e consistenza rispetto alla muratura principale, sia per i formati impiegati, sia per la varietà dei materiali scelti. Inoltre, un'accurata rifinitura superficiale permetteva di rispondere sia alle necessità strutturali che estetiche.

Nelle soluzioni angolari, nell'edilizia tradizionale, si trovano frequentemente blocchi lapidei ben squadrati (e solo in rari casi sagomati o modanati), di spessore notevole o di lunghezza superiore al normale, disposti a spina di pesce e alternati per creare una profonda indentatura con la muratura adiacente. Lo spigolo veniva talvolta smussato o tagliato a 45°, per facilitare il raccordo nell'angolo tra le due strade.

In alcune situazioni, si rinvengono archi di scarico posti sopra le aperture, la cui funzione era quella di distribuire il peso della muratura superiore su zone più resistenti della parete.

ABACO FOTOGRAFICO DEI CANTONALI

1. Cantonale messo in opera con conci di pietra squadrata con dettaglio soluzione d'angolo con l'impiego di conci sagomati a creare risega.
2. Cantonale con lavorazione superficiale a spina di pesce.
3. Cantonale con lavorazione superficiale a motivo floreale.
4. Cantonale con diatoni e indentature alla muratura adiacente.
5. Conci lapidei posti in opera con la funzione di indentatura per le porzioni da realizzarsi in seguito adiacenti; ammorsatura in soluzione d'angolo.
6. Cantonale messo in opera con conci di pietra squadrata.
7. Cantonale messo in opera con conci di pietra squadrata con dettaglio soluzione d'angolo con l'impiego di conci sagomati a creare risega.
8. Cantonale messo in opera con conci abbozzatamente squadrati e indentature alla muratura adiacente.
9. Cantonale messo in opera con conci abbozzatamente squadrati posti in maniera alternata secondo le due direzioni ortogonali.

Foto di Luisa Lombardo

1	2	3
4	5	6
7	8	9

Discesa su Via Giuseppe Garibaldi; ©Luisa Lombardo, 2023

Balconi

I balconi su mensole di pietra, sagomate e rastremate verso l'estremità secondo lo stile dell'intagliatore (con incisioni semplici, volute, riccioli doppi, forme zoomorfe, ecc.), sono realizzati in un unico pezzo o in più strati sovrapposti, integrandosi al suolo sia dal punto di vista figurativo che strutturale.

La scelta del tipo di pietra rispondeva sia a esigenze estetiche (facilità di lavorazione per l'intaglio) che strutturali (adeguata resistenza meccanica e durabilità).

Dal punto di vista strutturale, la porzione di incastro della mensola nel muro veniva lasciata grezza, con dimensioni superiori rispetto alla parte esterna, al fine di incrementare la sezione resistente e il peso stabilizzante. Per il suolo, solitamente si utilizzavano lastre di pietra di spessore variabile, talvolta modanate nelle versioni più raffinate. Il piano di calpestio era costituito da una o più lastre giustapposte, congiunte in corrispondenza della mensola centrale.

Per prevenire la rotazione delle mensole, soprattutto in corrispondenza dei vani, dove non vi era supporto murario sopra l'incastro, si inseriva una barra metallica ("*bardella*") all'interno del muro, che attraversava l'estradosso della mensola centrale e delle mensole adiacenti, già stabilizzate dal peso della muratura sovrastante.

I primi esempi di mensole metalliche, ancora presenti nell'edilizia contemporanea, si riferiscono a una soluzione strutturale semplice, con poche variazioni estetiche: un singolo pezzo di ferro piatto, sagomato a triangolo rettangolo, con un prolungamento su uno dei cateti che serviva per l'incastro a muro.

In altre configurazioni, per ottenere lo stesso risultato, venivano impiegati più ferri piatti; la barra diagonale, avente la stessa sezione della parte che sosteneva il piano di appoggio, veniva posizionata di taglio per aumentare la rigidezza della sezione. Alle estremità, la barra subiva una torsione di 90° in corrispondenza delle connessioni, permettendo l'unione tramite chiodatura.

Un'ulteriore variante del tipo precedente prevede il prolungamento del ferro obliquo, che, piegato lungo la parete, si unisce al ferro orizzontale. Questo accorgimento, assemblato in officina, consente di eseguire un unico incastro al muro.

Il sistema della mensola triangolare evolve con la sostituzione dell'asta diagonale con un elemento a doppio ricciolo in ferro "*quadratino*".

Alla fine del XIX secolo, l'uso di profilati metallici a doppio T per la realizzazione delle mensole di balconi inizia a diffondersi. Questa soluzione, pur essendo più solida dal punto di vista statico, nonostante le dimensioni contenute degli elementi, risultava meno interessante dal punto di vista estetico. Per questo motivo, spesso si cercava di ammorbidire l'aspetto delle mensole, sagomando le estremità con tagli a 45° o "a gola rovescia", che richiamavano modanature tipiche delle mensole in pietra. Altre soluzioni prevedevano l'aggiunta di elementi terminali a forma di goccia ("*brindoli*") o l'installazione di un sottomensola in ghisa con motivi arabescati.

Le mensole metalliche erano fissate alla muratura anche tramite un uncino o una barra metallica ("*bardella*"), inserita in un incavo ricavato all'estradosso dei profilati o in un foro praticato nell'anima.

Nel caso delle mensole metalliche, il piano di calpestio, che risultava significativamente più sottile rispetto a quello delle mensole in pietra, era costituito da una lastra in marmo o da un pacchetto di più strati sovrapposti. Questi strati poggiavano su sostegni metallici piatti, disposti trasversalmente rispetto alle mensole ("*cinte o traverse*"), e venivano alloggiati in appositi incavi ricavati nella parte superiore delle mensole, per garantire la continuità del piano di appoggio. Il "suolo a pacchetto" era composto da uno strato di mattoni ("*palmari*") posti sopra le barre piatte, un massetto e uno strato di finitura esterna, costituito da una o più lastre di marmo o ardesia, oppure da mattoni rustici, stagnati e decorati in modo semplice.

In alcune zone montane, si adotta un sistema piuttosto originale che non prevede l'uso di mensole, ma affida il sostegno del piano, sia esso a pacchetto o in pietra, a due tiranti posizionati lungo i lati corti del balcone. In questo modo, il piano, costituito da una griglia di barre piatte a sostegno della pavimentazione, risulta sospeso, evitando così l'ingombro delle mensole.

Le ringhiere metalliche sono uno dei sistemi di protezione dei balconi più comuni, grazie alla loro leggerezza, semplicità e all'applicazione di poche regole efficaci. Di solito, una ringhiera è composta da tre pannelli: due laterali e uno frontale, irrigiditi da un telaio costituito da una barra orizzontale alla base e una al corrimano, mentre i montanti d'angolo consentono il collegamento tra i pannelli.

I correnti superiori e inferiori dei pannelli laterali sono fissati alla muratura con un grosso uncino, mentre la ringhiera frontale è fissata agli estremi con spinotti passanti attraverso i fori ricavati nelle sezioni appiattite. Alla base del montante, si trovano sfere metalliche schiacciate, che fungono da cuscinetti di appoggio sul suolo del balcone.

Spesso, nella parte superiore del montante d'angolo, sono fissati elementi decorativi in ferro, rame o ottone, come vasi o pomi sferici. Nei modelli più antichi, i pannelli erano formati da semplici elementi verticali a sezione circolare o quadrata, collegati al corrimano superiore e inferiore tramite chiodatura; con il passare del tempo, le ringhiere sono state arricchite con archetti circolari, riccioli o motivi floreali alle estremità dei pannelli.

In molte ringhiere si trovano soluzioni esteticamente più complesse rispetto a quelle precedentemente descritte. Un esempio è il tipo a petto d'oca, caratterizzato da forme concavo-convesse, dove i montanti della ringhiera assumono una forma particolare, con un ricciolo di chiusura in corrispondenza del corrimano. Le varianti di design dipendono dalla posizione della concavità.

Nei balconi a petto d'oca, particolare attenzione è dedicata alla soluzione degli angoli e al raccordo con i montanti laterali. Spesso, per accentuare l'effetto estetico, i montanti venivano disposti a ventaglio attorno al vertice della colonna verticale, arricchiti con elementi decorativi.

Nei balconi, in particolare nell'edilizia nobiliare, le lunghezze possono essere notevoli, richiedendo l'uso di più pannelli frontali, rinforzati da piantali o piantane (detti localmente "*venti*"). Questi elementi verticali venivano posizionati in modo da consentire il passaggio, e venivano ripiegati fino all'incastro con il muro.

L'uso del ferro è anche ricorrente in altri elementi decorativi, come le roste e le grate. In particolare, i sopraluce a ventaglio, molto diffusi anche nell'edilizia minore, sono costituiti da un telaio fissato alla muratura e un pannello decorativo ("*posta*") a maglia larga, che permette il passaggio di aria e luce. Per realizzare questo tipo di pannello, si utilizzavano aste a sezione circolare convergenti al centro del semicerchio o, nei casi più elaborati, pannelli in ferro piatto sagomato o in ferro battuto con motivi fitomorfi.

Per quanto riguarda le connessioni tra gli elementi metallici, le soluzioni più comuni includono la realizzazione di fori (chiamati "*occhi*") per l'inserimento della barra concorrente, la chiodatura per la giunzione "a mezzo spessore" di elementi a sezione rettangolare, o, nel caso di elementi di sezione ridotta, l'uso di legacci in ferro dolce per avvolgere e unire le parti da collegare.

Le grate utilizzate per proteggere dai tentativi di effrazione le finestre al piano terra sono spesso di tipo ad aste compenetrate, disposte con asole alternate in modo da evitare lo sfilamento una volta installate. Queste grate possono presentare una trama con disposizione verticale-orizzontale o a 45°.

Balcone vicino Vicolo Fatta; ©Luisa Lombardo, 2023

ABACO FOTOGRAFICO DEI BALCONI

1. Balcone a mensole lapidee con lavorazione e doppio ricciolo, suolo composto da lastre lapidee incastrate nella muratura e parapetto "a petto d'oca".
2. Balcone con struttura metallica costituita da mensole e suolo lapideo e ringhiera metallica con montanti verticali; lavorazione terminale della mensola con funzione di rompigoccia.
3. Balcone costituito da mensole e suolo lapideo e ringhiera metallica con montanti verticali; lavorazione terminale della mensola con funzione di rompigoccia.
4. 5. 6. Balcone con struttura metallica costituita da mensole e suolo lapideo e ringhiera metallica con montanti verticali; lavorazione terminale della mensola con funzione di rompigoccia.
7. Balcone a mensole lapidee con lavorazione a doppio ricciolo e altorilievi sulle facce laterali.
8. 9. Balcone con struttura metallica costituita da mensole e suolo lapideo e ringhiera metallica con montanti verticali; mensola con decoro.

Foto di Luisa Lombardo

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Nei casi più semplici, le aperture sono configurate con stipiti realizzati con gli stessi materiali utilizzati per la muratura adiacente; l'architrave è composto da tronchi lasciati allo stato grezzo, affiancati lungo tutto lo spessore murario (in alcuni casi rari, si riscontra l'uso di architravi lignei sagomati) o da blocchi lapidei monolitici. Se l'apertura è ad arco, questo può essere realizzato in conci lapidei naturali o mattoni.

La soglia, date le dimensioni ridotte del vano, è costituita da uno o più blocchi di pietra calcarea compatta.

Sono molto diffusi i portali lapidei a profilo retto, realizzati con conci lunghi e sottili che interessano la porzione esterna della sezione muraria. Nelle soluzioni meno raffinate, nella zona mediana dei piedritti, è riconoscibile il "*crocco*", ossia un concio orizzontale di minori dimensioni che si incastra nel muro, mentre gli archivolti variano dalle soluzioni più comuni in pietra sbozzata a quelle in pietra lavorata, con concio in chiave pronunciato e spesso con conci d'imposta sagomati a volute e motivi floreali. Altri esempi presentano lunghi conci lapidei, composti da soli due pezzi arcuati che si giuntano in chiave. Più raro è l'uso di un unico blocco sagomato ad arco, che copre una luce mai maggiore di 1,00-1,20 m.

Per quanto riguarda i portali in mattoni lasciati a vista, essi presentano laterizi di ammorsatura nei piedritti e un apparecchio arcuato con semplice o doppia ghiera. Altri sistemi impiegano più filari di mattoni alternati a blocchi di pietra compatta intagliata, che proseguono con indentatura nella muratura caotica adiacente.

Spesso, l'apertura su strada è arricchita da un soprapporta o sopraluce, utile per illuminare e consentire il passaggio dell'aria al piano terra. Questo foro, di dimensioni ridotte rispetto alla dimensione del vano, si inserisce nell'apparato unico del portale, assumendo forma regolare o semicircolare.

In alcuni casi, sono state rintracciate aperture su strada la cui forma e dimensione fanno presumere che il piano terra fosse destinato ad attività commerciale: un unico grande vano di apertura consentiva il passaggio e l'esposizione della merce. Le configurazioni riscontrate e le diverse soluzioni costruttive, dai casi più semplici a quelli più complessi, sono state analizzate attraverso apposite schede.

A protezione del piano terra, è collocato un portone a una o due ante, a seconda della dimensione del vano, sul quale spesso è presente un piccolo sportello apribile per consentire il passaggio di luce e aria.

Finestra a Polizzi Generosa; ©Luisa Lombardo, 2023

Aperture e vani di finestra

Il sistema di foratura per la realizzazione dei vani finestra non si discosta molto dalle soluzioni utilizzate per altre aperture su strada; si riscontrano quindi architravi lignei orizzontali, composti da pezzi sagomati o lasciati grezzi, pietra sbozzata e intagliata. Nei casi più ricercati, i vani sono definiti da cornici in intonaco.

Si segnalano anche alcune aperture più modeste, con geometrie non rettilinee: oculi, forme pseudo-ellittiche o polilobate. In tutti questi casi, la particolare forma richiede la realizzazione di pezzi speciali. Un'attenzione particolare era dedicata ai davanzali: nei casi più semplici, sono rifiniti in intonaco, con mattonelle stagnate ("*riggiole*") o lastre lapidee. In soluzioni più complesse, sono realizzati in pietra intagliata, composta da uno o più pezzi con diverse sagomature e variamente aggettanti rispetto alla muratura. Particolare è l'uso di mensole (in legno, pietra rustica o modanata, o in metallo) collocate all'esterno del vano per permettere l'appoggio di assi o tavole di legno, con una doppia funzione: come piano per vasi con piante o per stendere la biancheria.

Finestre e Porte Finestre

Le finestre sono generalmente di forma rettangolare alta, realizzate in legno, a una o due ante, di colore verde o marrone. Le finestre sono chiuse tramite persiane o scuri, con le prime utilizzate più comunemente. Spesso, le finestre sono sormontate da piccole mensole metalliche, con una lastra sovrastante in marmo o pietra compatta, dotata di adeguata acquatura.

Solitamente, una lastra in marmo con rompigoccia è posizionata nella parte inferiore della finestra, sebbene talvolta possa essere sostituita da legno o laterizio, o addirittura essere assente.

La protezione del vano al piano terra è garantita da infissi opachi, costituiti da due ante mobili con doppio finestrino o da riquadri vetrati con scuretto posto internamente. I ferramenti per questi infissi si distinguono in base alla posizione del paletto, che può essere superiore o inferiore. Lo scuretto è fissato tramite un paletto rotante che si blocca all'infisso con una leggera forzatura. Questi sono principalmente impiegati per chiudere vani di dimensioni ridotte, o esposti a nord, per meglio schermare dalle correnti fredde.

Il telaio in legno, fissato con cerniere al controtelaio, è composto da montanti e traversi lasciati a vista all'interno, mentre all'esterno la superficie è resa continua da tavole chiodate o da una fodera metallica con chiodi ribattuti. I ferramenti di chiusura comprendono un saliscendi metallico (sostituito in alcuni casi da un semplice traverso in legno). I portoncini sono quasi sempre privi di serratura, ma in alcuni rari casi sono presenti serrature a chiave e maniglia.

Portali

I portali sono frequentemente contornati da elementi lapidei che hanno principalmente una funzione decorativa. I sistemi più semplici vengono valorizzati quando più filari di mattoni si alternano con blocchi di pietra compatta intagliata, che proseguono con indentatura nella muratura caotica adiacente.

I portali lapidei a profilo retto o arcuato, realizzati in conci lunghi e sottili, interessano la porzione esterna della sezione muraria; nelle soluzioni meno raffinate, nella zona mediana dei piedritti, è possibile riconoscere il *crocco*, ovvero un concio orizzontale di dimensioni minori che si incassa nel vivo del muro.

Gli archivolti variano dalle soluzioni più comuni in pietra sbozzata e/o mattoni a quelle in pietra lavorata, con chiave intagliata, spesso prominente. Altre soluzioni prevedono l'uso di lunghi conci lapidei composti da soli due pezzi arcuati che si giuntano in chiave. Più raro è l'uso di un unico blocco sagomato ad arco.

Edificio a Polizzi Generosa; ©Luisa Lombardo, 2023

ABACO FOTOGRAFICO DELLE APERTURE

1. Infisso in legno con persiane.
2. Aperture su strada per l'ingresso all'abitazione e il passaggio della mercanzia.
3. Portafinestra con affaccio su balcone di dimensioni ridotte.
4. Oculo in conci intagliati.
5. Vano di finestra rettangolare realizzato con pietra intagliata.
6. Vano di finestra realizzato con pietra intagliata a C e concio di di chiusura in chiave e alla base.
7. Portale in pietra concia ad intradorsso arcuato realizzato a più pezzi e conci di ammorsatura agli stipiti.
8. Portale costituito da conci squadrati .
9. Portale in pietra concia ad intradorsso arcuato realizzato a più pezzi.

Foto di Luisa Lombardo

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Scorci di Polizzi Generosa; ©Luisa Lombardo, 2023

Coperture

Le coperture degli edifici sono generalmente a una o due falde, con travi in legno di abete e un ordito secondario costituito da travicelli rustici e pianelle in cotto, sormontate da coppi siciliani, murati esternamente e sostenuti in sommità da pietre per evitarne il ribaltamento in caso di forte vento.

Per completare la copertura e favorire il deflusso delle acque meteoriche, i cornicioni sono progettati in modo da garantire un sistema di drenaggio efficiente. Un esempio molto comune di questa tipologia è il cornicione "*alla cappuccina*", spesso coadiuvato dai pluviali o "*catusati*".

Alcune coperture si presentano con un'unica falda, costituita da travi di dimensioni modeste, disposte a distanza contenuta. L'orditura secondaria è costituita da una stuoia di canne intere, irrigidita da una grossa canna legata con cordicella. Sopra lo strato di canne, viene steso un massetto compatto di calce e aggregato minuto, su cui vengono posati i coppi "maritati". Lo smaltimento delle acque meteoriche è assicurato dallo sporgenza dell'ultimo filare di coppi.

In altre configurazioni, la copertura può essere a falda unica, con travi lignee disposte ortogonalmente alla pendenza della copertura. La struttura è completata da un tavolato posto ortogonalmente all'orditura lignea, fissato tramite chiodatura. Il manto di copertura è realizzato con coppi siciliani, e il colmo è sigillato con malta. Lo smaltimento delle acque è garantito dall'aggetto dell'ultimo ordine di coppi.

I cornicioni, particolarmente in un'area montana caratterizzata da elevata piovosità, svolgono una funzione protettiva per i paramenti di facciata, spesso in pietra a faccia vista, e offrono anche un supporto alle ultime file di coppi in aggetto, assicurando il rapido deflusso delle acque piovane.

Tra le numerose varianti costruttive, la più comune è il cornicione "*alla cappuccina*", che utilizza elementi laterizi piani e coppi, disposti progressivamente in aggetto rispetto al filo esterno della muratura. Questa tipologia presenta da 2 a 7 filari sovrapposti di mattoni, coppi e altri elementi di diverse forme, spessori e disposizioni, con spigoli piani o arrotondati, soddisfacendo anche un'esigenza estetica.

In altre varianti di cornicioni, il laterizio è modellato in mensole sottili, la cui estremità è sagomata a voluta, sorreggendo il pianellato orizzontale terminale. Al loro interno si definiscono campi verticali sopra una cornicetta di base, nei quali sono inserite formelle laterizie decorative con semplici motivi.

In casi più rari, il coronamento dell'edificio è affidato a lastre lapidee infisse nella muratura o a conci di pietra sagomati e modanati, lasciati a vista o semplicemente sbozzati e rivestiti in intonaco.

Il sistema di smaltimento delle acque meteoriche avviene tramite gronde in lamiera sagomata, che seguono le forme del cornicione che le sostiene. Quando il cornicione sommitale manca, gli embrici sono composti da sequenze inclinate di coppi, sostenuti da mensolette in pietra o mattone, da grossi chiodi semplicemente infissi nella parete muraria, o da elementi metallici con estremità sagomata per adattarsi alla curva del coppo e garantirne un appoggio continuo. Un'alternativa meno frequente prevede l'incasso dei coppi d'embrice su una risega esterna del muro, inclinata appositamente. Il sistema si completa con un coppo "*gettatore*" orizzontale, o con discendenti in tubi laterizi impilati, che convogliano l'acqua verso la strada, talvolta con l'ausilio di un blocco lapideo forato alla base.

Palazzo della Cultura; ©Luisa Lombardo, 2024

Palazzo signorile; ©Luisa Lombardo, 2024

ABACO FOTOGRAFICO DELLE COPERTURE

1. Gronda sorretta da un sistema di embrici e coppi aggettanti dal filo murario. L'acqua è incanalata in un discendente pluviale posto all'estremità, formato da imbuto e tubatura in laterizio ("catusato").
2. Solaio ad orditura lignea e strato di "incannucciato".
3. Solaio ad orditura lignea con canne intere schiacciate poste ortogonalmente all'orditura principale ed unite con cordicella.
4. Sistema di smaltimento delle acque alla "cappuccina" a 3 filari sovrapposti di mattoni per il rapido allontanamento delle acque piovane.
5. Sistema di smaltimento delle acque a stillicidio libero per il rapido allontanamento delle acque piovane.
6. Cornicione alla cappuccina con laterizi disposti su filari, con coppi via via aggettanti e due filari di mattoni.
7. Sistema di smaltimento delle acque a stillicidio libero per il rapido allontanamento delle acque piovane.
8. Sistema di smaltimento delle acque a stillicidio libero per il rapido allontanamento delle acque piovane.
9. Pietre fermacoppi.

Foto di Luisa Lombardo

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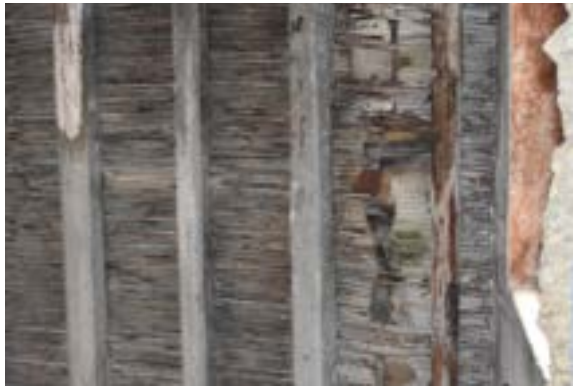


Vita lenta a Polizzi; ©Luisa Lombardo, 2024

Impaginato dei prospetti su strada (intonaci e rivestimenti, ...)

I prospetti degli edifici di base di Polizzi Generosa non sempre seguono una simmetria compositiva rigorosa, ma si fondano su principi costruttivi abbastanza rigidi e uniformi su tutto il territorio.

Indipendentemente dal numero di piani (che può essere uno, due o tre, come nel caso dei palazzetti), gli edifici presentano variazioni che modificano l'ordine delle fronti architettoniche, in funzione della disposizione degli accessi, della localizzazione delle scale esterne, e della presenza di pareti cieche o forate, nonché delle eventuali simmetrie e asimmetrie nelle aperture. Dalle analisi delle diverse tipologie, emergono alcuni parametri comuni che riflettono il modo di vivere e concepire gli spazi. Ogni abitazione è dotata di arredi fissi funzionali alle attività domestiche e lavorative, come mangiatoie nella stalla, anelli metallici e lapidei all'esterno per legare gli animali, cucine con focolaio e forno, e armadi ricavati nello spessore delle murature, adibiti a dispense. Per quanto riguarda le coperture, queste presentano generalmente una falda nel caso di abitazioni confinate su due lati e angolari, due falde per le case confinate su due lati o quelle di testa, e a volte anche coperture a tre o quattro falde, soprattutto nelle case isolate o di testa. Le coperture a terrazza sono relativamente rare, limitate a casi di sopraelevazioni parziali sopra la linea di gronda originaria. Un'altra caratteristica comune è la posizione della scala, che spesso si trova a ridosso di un muro perimetrale o tra due muri. I prospetti degli edifici sono generalmente molto semplici, arricchiti da finestre e porte finestre, e possono essere intonacati o lasciati a faccia vista.

Nei solai piani, la trave in legno costituisce l'orditura tipica, con un interasse ridotto, generalmente tra i 40 e i 50 cm, per sfruttare al meglio le sezioni limitate e non sempre lineari che i boschi locali mettevano a disposizione. La presenza di profilati a doppio T, assai più costosi e non di produzione locale, è piuttosto sporadica e risale principalmente all'ultimo decennio dell'Ottocento.

Nei solai, è praticamente assente la lunga tavola piallata su più appoggi, caratteristica delle architetture nobili. In alcuni casi, si utilizzano tavole appoggiate su tre supporti ravvicinati, alle quali viene aggiunto un regolo coprifilo inferiore per regolarizzare l'intradosso e evitare l'uso di un controsoffitto per mascherare eventuali difetti. In altri casi, si impiegano tavole rustiche, più spesse, che coprono una sola campata con un interasse maggiore; per evitare che la chiodatura alle estremità delle tavole diventasse precaria, venivano usate travi di sezione più grande e forma più regolare.

Un sistema economico e tradizionale per riempire gli spazi tra le travi consiste nell'uso di piccoli tronchi rustici, del diametro medio di 8 cm, tagliati lungo l'asse ("*mezzi ginelli*"), chiodati alle travi con la faccia piatta rivolta verso il basso, creando una superficie sufficientemente continua. Un'altra soluzione locale prevedeva l'uso di stuoie di canne intere, di grosso diametro, legate con filo di ferro alle travi, formando il supporto per un massetto e la pavimentazione. Questo sistema si riscontrava su campate strette o in copertura.

In alcune costruzioni, una seconda orditura, realizzata con listelli squadrati posti a un interasse di circa 25 cm, regge un piano continuo formato da pianelle in mattoni palmari spessi 2 cm, su cui viene disposto un massetto o direttamente il manto di coppi.

Una caratteristica frequente e singolare sono le chiusure dei campi di orditura, realizzate con getti di gesso misto ad aggregati di varia natura, spesso conformate a volta a botte all'intradosso. Nel gesso venivano incorporati pezzi di materiale gessoso di diversa pezzatura, provenienti da demolizioni, o scarti di sughero per alleggerire l'impasto.

Il problema della limitata aderenza tra legno e gesso veniva risolto con incisioni fatte con colpi d'ascia e chiodi disposti lungo i lati delle travi, specialmente nei solai di grande luce. Recenti ricerche suggeriscono che l'effetto espansivo del gesso durante la fase di indurimento creasse una sorta di pretensionamento della struttura lignea principale, migliorando il comportamento statico dell'intero sistema, anche in relazione a travi di dimensioni insufficienti.

Il sughero rustico veniva anche utilizzato in fogli di maggiori dimensioni, disposti affiancati, con il gesso colato tra le facce. Con l'aumento del volume, il gesso solidarizzava l'intero sistema del solaio.

Per le vie di Polizzi; ©Luisa Lombardo, 2024

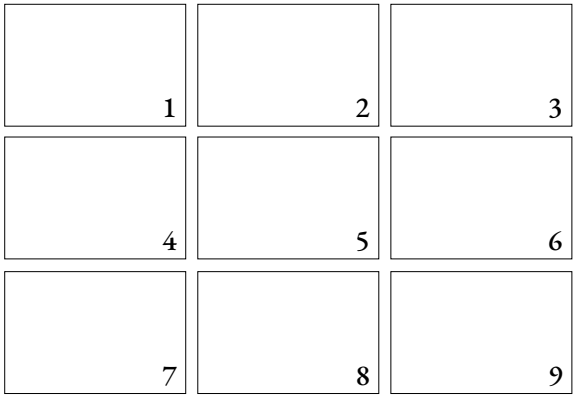
L'uso delle catene metalliche come sistema di connessione stratica o di presidio sismico è abbastanza frequente. Queste catene, inserite alla quota di solaio e di copertura, presentano generalmente capichiave esterni che possono essere conformati in modo semplice, come barre dritte, o a forma di Y o X. Nei casi più antichi, è possibile trovare forme fitomorfe realizzate in ferro battuto.

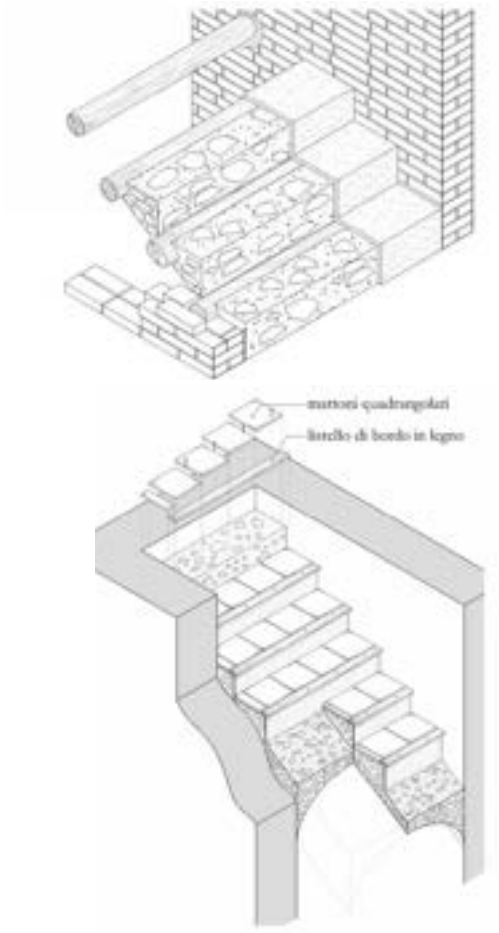
Sono stati identificati due tipi principali di sistema di serraggio per mettere in tensione le catene: il primo prevede un occhiello esterno nel quale un paletto e dei cunei metallici vengono battuti con forza, mentre il secondo, generalmente più recente, utilizza una testa filettata su cui viene avvitato un dado. Nonostante la robustezza delle sezioni murarie e la limitata altezza, l'edilizia di base ha frequentemente utilizzato catene metalliche, inserite nei solai e nelle coperture, i cui capichiave esterni sono spesso semplici nella loro forma, come barre dritte o a Y. Tuttavia, non sono rari i casi in cui queste catene siano state adattate ai gusti dell'epoca, andando oltre la semplice funzione statica e assumendo caratteristiche artistiche, grazie alla lavorazione del ferro battuto.

ABACO FOTOGRAFICO DELLE CATENE METALLICHE

1. Capochiave a fascia singola in ferro battuto.
2. Capochiave quadrato in ghisa con serraggio della catena.
3. Capochiave a fascia singola con serraggio della catena.
4. Bolzone a paletto.
5. Capochiave in ferro battuto.
6. Bolzone ad Y.
7. Bolzone ad Y.
8. Bolzone ad Y con barra di collegamento verticale.
9. Capochiave a fascia singola con serraggio della catena.

Foto di Luisa Lombardo





Assonometrie delle scale presenti nel contesto Madonita, tratto da "L*a tradizione costruttiva nell'area delle Madonie*" G. Fatta, T. Campisi, M. Li Castri, S. Lo Piccolo, C. Vinci, Alinea Edizioni, 2007.

Le scale a struttura portante autonoma, che raramente superano il metro di larghezza, sono generalmente appoggiate su volte a botte o rampanti in muratura o in getto, oppure su solaio ligneo inclinato. Nel primo caso, i gradini in pietra e malta sono riportati e, quando privi di rivestimento lapideo, presentano spesso il bordo protetto da un listello in legno, fissato con chiodi o incorporato nella malta.

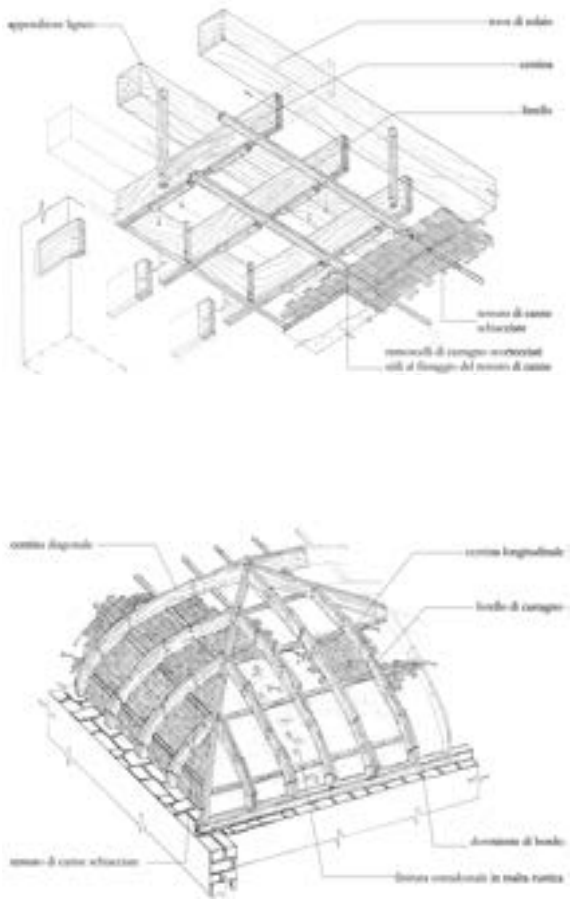
Nel caso di strutture lignee, l'appoggio delle travi oblique, chiamate "*cosciali*", avviene tramite travetti di dimensioni maggiorate posti tra due travi contigue del solaio, perpendicolari a esse.

I gradini sono costituiti da pedata e alzata in legno, fissati tra loro tramite chiodatura e incassati lateralmente in una scanalatura che segue il profilo dei gradini, ricavata nei cosciali. La parte inferiore dei gradini è resa continua mediante l'apposizione di tavole poggiate sui cosciali o, per luci più strette, da tavole disposte lungo l'asse della scala.

Nel più raro caso di scale in sede propria, la struttura prevedeva travi lignee incastrate tra le pareti, sulle quali veniva eseguito un getto di malta di gesso mescolato con elementi grossolani per formare i gradini.

Altri esempi, anche questi poco frequenti ma comunque documentati, includono scale con gradini riportati appoggiati su un sistema di piccole semi-volte rampanti in getto, disposte su più ordini.

Un ulteriore caso, sebbene non rappresentato graficamente e ascrivibile all'edilizia di pregio, riguarda le scale con gradini in getto riportati su una volta a botte a due o più strati lungo la rampa, e a crociera nei pianerottoli.



Disegno dei controsoffitti piani e voltati, tratto da "*La tradizione costruttiva nell'area delle Madonie*" G. Fatta, T. Campisi, M. Li Castri, S. Lo Piccolo, C. Vinci, Alinea Edizioni, 2007.

I controsoffitti piani e a "*finta volta*", nei quali il tessuto di canne schiacciate (detto "mezzacanna" o "un quarto di canna" palustre, con intrecci variabili per densità), è conformato e sostenuto da robuste centinature in tavole accoppiate e chiodate (di solito due tavole per l'intero sviluppo, e tre all'appoggio nei sistemi a volta), a cui è ancorata un'orditura secondaria di listelli, che ne rafforzano la connessione e l'irrigidimento.

Il sistema è integrato da ulteriori elementi vegetali, come stecche di castagno scortecciate, che impediscono lo sfilamento dei chiodi dal tessuto di canne, o tavolette di legno o grosse canne intere, legate con filo di ferro o corda, per migliorare il supporto del tessuto e limitare le deformazioni nei campi strutturali.

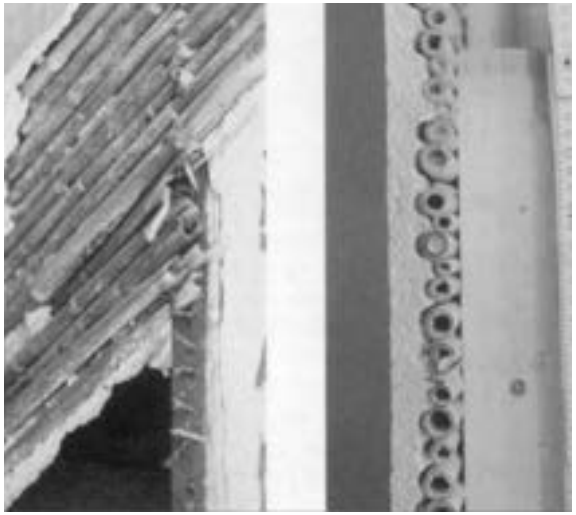
In alcuni casi, a maggiore garanzia della stabilità, si osservano connessioni tra i soffitti e gli orizzontamenti superiori (tetti o solai) mediante "appenditori" in legno, vincolati all'ordito principale e alle facce laterali delle centinature, o dormienti di legno, per fornire un appoggio continuo ai piedi delle centine.

La finitura intradossale prevede quasi sempre una superficie continua intonacata, con la creazione di una cornice perimetrale all'imposta nei casi più ricercati, o un semplice raccordo a muro. Quando si utilizzava malta di gesso per la formazione di una cappa estradossale, si provvedeva contemporaneamente a proteggere il tessuto di canne con spalmature di cera o olio cotto, per evitare rischi di putrescenza.

Un altro elemento tecnico comune nelle costruzioni tradizionali, per la leggerezza, la semplicità costruttiva e le buone prestazioni, è rappresentato dai tramezzi formati da un'ossatura in legno (detta intilarata) rivestita su entrambi i lati. Le soluzioni

più "raffinate" prevedono che montanti e traversi siano connessi "*a mezzo spessore*" tramite incavi, con tessuto di canne schiacciate intonacato steso in piano da sottili listelli vegetali chiodati. In ambienti di minore impegno, invece, si utilizzavano canne intere di grosso diametro, disposte in stuoie legate da canne trasversali. In questi casi, i traversi sono semplicemente chiodati ai montanti sul lato che delimita l'ambiente non rifinito.

Nel contesto montano, le maestranze locali raccontano che era consuetudine riempire il campo strutturale dell'intilarata con blocchetti di gesso e sughero delle dimensioni di circa 8x10x12,5 cm. Nei centri con tradizione produttiva di laterizi, per i tramezzi si usavano generalmente mattoni di formato 5x12x25 cm, disposti a testa e con giunti sfalsati.



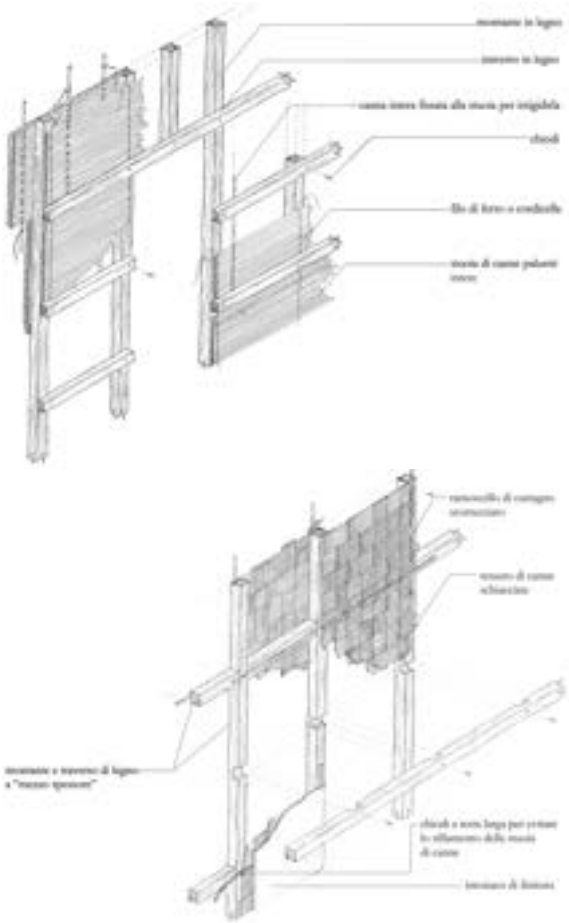


Foto storiche e disegno dei tramezzi leggeri presenti nel contesto Madonita, tratto da "*La tradizione costruttiva nell'area delle Madonie*" G. Fatta, T. Campisi, M. Li Castri, S. Lo Piccolo, C. Vinci, Alinea Edizioni, 2007.

Polizzi Generosa al tramonto; ©Luca Sabatino, 2023

Monumento dei caduti dal Belvedere;
©Calogero Piampiano, 2023

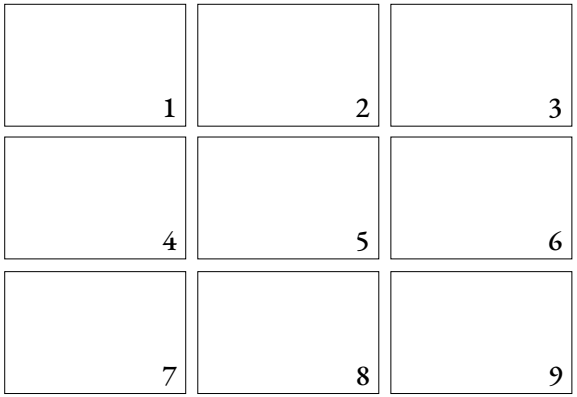
Le pavimentazioni esterne giocano un ruolo fondamentale nella qualità degli spazi urbani, combinando semplicità e funzionalità, frutto di una lunga tradizione costruttiva. Tra le tipologie più comuni troviamo i "selciati", formati da guide e catene che racchiudono aree riempite con materiali grezzi o ciottoli.

Le guide e le catene sono realizzate con conci di calcare compatto di piccole dimensioni o con mattoni posizionati di taglio. Talvolta, le guide interne (rotaje), che definivano le aree di passaggio dei carri, sono trattate con strisce regolari di materiale più solido. Il riempimento tra le guide e le rotaje avviene con ciottoli grandi o scaglie della stessa pietra, spesso di dimensioni notevoli (pezzotti). Il design delle pavimentazioni, in particolare nelle zone di piazze e spazi aperti, presenta talvolta variazioni cromatiche ottenute utilizzando materiali diversi. Per ridurre i dislivelli nelle strade pedonali ripide, si utilizzano cordonate formate da blocchi lapidei compatti e squadrati, posti in coltello e di dimensioni contenute. In alcuni casi, un impluvio centrale viene realizzato con lo stesso materiale, mentre per il riempimento dei campi si usa pietra rotta, come nel caso dei selciati.

ABACO FOTOGRAFICO DELLE PAVIMENTAZIONI STRADALI

Img. 1. Lastricato di pietra di mirto con disposizione a spina di pesce e catene a "rotaje" in pietra lavica.
Img. 2. Guide, catene a "rotaje" in mattoni e campo in pezzotti.
Img. 3. Pavimentazione in piazze a ricco disegno.
Img. 4. Guide, catene a "rotaje" in mattoni e campo in pezzotti.
Img. 5. Selciato con disposizione a spina di pesce e guida centrale.
Img. 6. Selciato con pavimentazione in slargo a ricco disegno.
Img. 7. Pavimentazione in piazze a ricco disegno.
Img. 8. Pavimentazione in selciato.
Img. 9. Lastricato di pietra di mirto con disposizione a spina di pesce e catene a "rotaje" in pietra lavica.

Foto di Luisa Lombardo



Polizzi Generosa in tramonto; ©Calogero Piampiano, 2023

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Discesa del Collegio; ©Luisa Lombardo, 2023

Edificio tra Via Roma e Via Castelli; ©Luisa Lombardo, 2023

3_Valori identitari e Decoro urbano

Vicolo Di Chiara; ©Luisa Lombardo, 2023

Strategie per la salvaguardia e il raggiungimento del decoro urbano e architettonico

Per garantire indispensabili parametri di decoro all'edilizia di Polizzi Generosa, è imprescindibile preservare i caratteri identitari dell'architettura tradizionale, che rappresentano la memoria culturale e storica del territorio. Il decoro, inteso come equilibrio tra estetica e funzionalità dell'habitat urbano, è un valore primario per la comunità locale e richiede azioni mirate alla tutela e alla valorizzazione di beni storici, artistici e architettonici, espressione della civiltà e delle radici culturali del luogo.

Nel contesto di Polizzi Generosa, il concetto di decoro urbano non si riduce alla mera estetica, ma si estende alla salvaguardia dell'identità architettonica e paesaggistica. È essenziale prevenire la perdita dei caratteri originari e contrastare la sostituzione con elementi incongruenti, estranei e decontestualizzati, che rischiano di alterare irrimediabilmente l'armonia del paesaggio urbano e il suo valore culturale.

Il patrimonio edilizio del centro storico di Polizzi Generosa, ancora in gran parte inesplorato in termini di consistenza e qualità, costituisce una risorsa preziosa. Recenti attività di censimento e rilievo fotografico hanno messo in evidenza tanto il valore intrinseco del patrimonio quanto le difformità rispetto alla tradizione costruttiva locale. Queste analisi hanno permesso di identificare vulnerabilità e criticità che richiedono interventi mirati per garantire il recupero e la conservazione del tessuto urbano storico.

Gli interventi necessari sono stati classificati in tre tipologie, sulla base della gravità delle difformità riscontrate:

- **Rosso:** interventi di grande entità, volti a risolvere problematiche strutturali e a ripristinare l'integrità originaria.
- **Giallo:** interventi di modesta entità, necessari per mitigare difformità che compromettono l'armonia e la funzionalità dell'edificio.
- **Verde:** interventi lievi, finalizzati alla conservazione e alla manutenzione delle caratteristiche esistenti.

Queste linee guida definiscono un approccio operativo chiaro per i progetti di rigenerazione urbana, orientato alla compatibilità con i principi della tradizione costruttiva locale. La salvaguardia del decoro architettonico e urbano non è soltanto una questione estetica, ma un dovere culturale e sociale, volto a garantire un futuro in cui passato e innovazione possano convivere in modo armonioso e sostenibile.

Palazzo Barone Carpinello; ©Michele Tumminello, 2022

Chiesa Madre; ©Michele Tumminello, 2023

Legenda

- Massimo intervento
  - S/T — Vulnerabilità strutturale o scarse prestazioni tecnologiche
  - F — Perdita della funzione originaria / Incongrua funzione attuale
  - DU — Decremento del Decoro Urbano
- Medio intervento
  - R — Rimozione di elementi incongrui / Ripristino
  - M/S — Modifica e/o Sostituzione
  - Ms — Manutenzione Straordinaria
- Minimo intervento — Manutenzione Ordinaria

Interventi virtuosi mutuati da altri contesti urbani

Massimo intervento

Sono interventi che richiedono l'impiego di una figura professionale, un tecnico, o di una squadra edile per risolvere la problematica riscontrata. Il singolo cittadino, o proprietario di casa che sia, non può risolverlo autonomamente.

S/T: Vulnerabilità strutturale o scarse prestazioni tecnologiche
Si riferisce alla struttura dell'edificio o a un elemento caratterizzato da proprietà non conformi alle peculiarità del costruito storico, risultato di scelte progettuali ed esecutive inadeguate o insufficientemente attente alla specificità del contesto architettonico e culturale.

F: Perdita della funzione originaria / Incongrua funzione attuale
L'edificio si presenta privo di una funzione specifica e richiede interventi che coniughino trasformazione e conservazione, privilegiando il mantenimento delle caratteristiche originarie ove possibile. Nel caso in cui le funzioni originarie non siano più sostenibili o compatibili con le esigenze attuali, è necessario individuare nuovi utilizzi che rispettino le peculiarità dell'edificio e ne valorizzino l'identità storica e architettonica. Gli interventi devono mirare a reintegrare gli elementi preesistenti, armonizzandoli con soluzioni contemporanee che siano compatibili con il contesto e ne garantiscano una fruizione attuale.

DU: Perdita del Decoro Urbano
Un degrado evidente che, oltre a evidenziare errori tecnologici, si manifesta attraverso la perdita dei caratteri identitari dell'edificio. La sostituzione di elementi originali con componenti incongruenti, estranei e avulsi dal contesto, compromette l'armonia complessiva e deturpa il paesaggio, generando un impatto negativo tanto visivo quanto culturale.

Medio intervento

Sono interventi che il proprietario può risolvere autonomamente o, in alcuni casi, con una squadra edile, volti al miglioramento del decoro urbano e architettonico attraverso la rimozione, la modifica o manutenzione del manufatto o la tinteggiatura.

R: Rimozione di elementi incongrui / Ripristino
L'elemento riscontrato necessita di un'immediata rimozione perchè considerato elemento di disturbo per il manufatto architettonico.

M/S: Modifica e/o Sostituzione
L'elemento può essere modificato o manutenuto al fine di rispondere ai criteri di decoro urbano o architettonico.

T: Manutenzione Straordinaria
Attraverso la tinteggiatura dell'elemento o alla modifica della colorazione è possibile ricorrere ad una soluzione definitiva o, parzialmente, corretta per rispondere ai criteri di decoro urbano o architettonico.

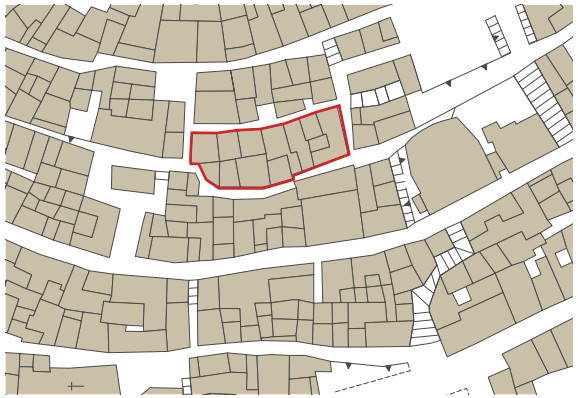
Minimo intervento

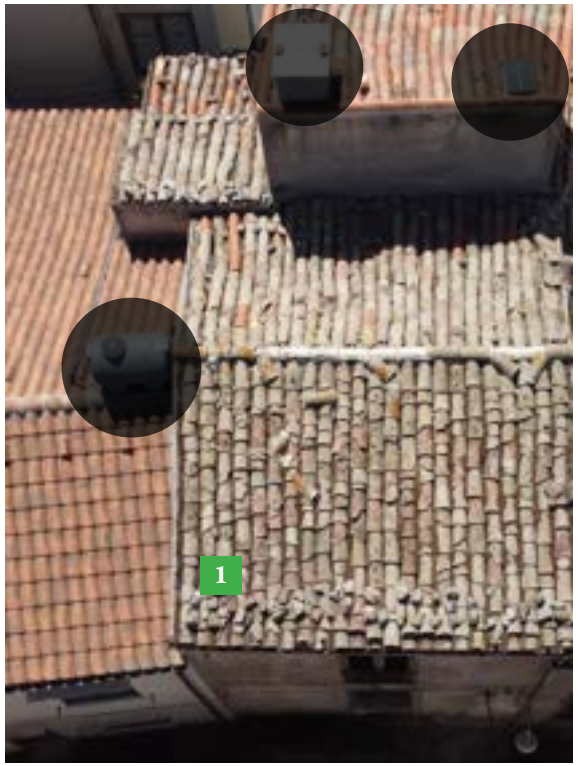
Manutenzione Ordinaria:
L'elemento è corretto e perfettamente integrato nel contesto urbano, le migliorie da apportare sono molto piccole, ma non è di disturbo per l'ambito urbano o per il manufatto architettonico. Può non subire alcuna trasformazione e rimanere tale e quale.

Interventi virtuosi mutuati da altri contesti urbani

Laddove non si riscontra una buona pratica in loco si propone una buona pratica introdotta in altri contesti.

Analisi dell'isolato di Vicolo Cilluffo





Rilievo fotografico e geometrico; ©Luisa Lombardo, 2023

Per chiarire un processo metodologico applicabile, si analizza il caso dell'isolato di Vicolo Cilluffo, concentrandosi sugli edifici del prospetto nord. L'obiettivo è valutare le condizioni dello stato di fatto e definire gli interventi necessari per migliorare lo stato dell'arte della stecca edilizia, garantendo un approccio coerente e rispettoso delle peculiarità locali.

Ciascun edificio presenta caratteristiche peculiari, influenzate dalla propria storia e dagli interventi che lo hanno interessato nel tempo. È possibile rilevare situazioni di degrado strutturale e materico, dissesti più o meno gravi e, in alcuni casi, esempi virtuosi di recupero. Tali problematiche possono interessare diverse componenti dell'edificio, come coperture, prospetti, solai o altri elementi costruttivi. Le criticità individuate derivano da molteplici fattori, quali errori progettuali o esecutivi, utilizzo di materiali di scarsa qualità, problematiche strutturali non risolte, carenze nella manutenzione ordinaria e straordinaria, o interventi effettuati senza un'adeguata considerazione della storicità e delle caratteristiche specifiche del contesto edilizio. Un ulteriore elemento critico è rappresentato dall'impiego di tecnologie non compatibili con il contesto architettonico e storico degli edifici, che ha portato a soluzioni inadeguate e, in alcuni casi, deturpanti.

L'analisi visiva rappresenta un primo strumento metodologico utile per comprendere le condizioni dell'edificio e individuare le priorità di intervento. Questo metodo consente di rilevare con immediatezza i principali segni di degrado e di definire le azioni da intraprendere, rendendo tali informazioni comprensibili non solo ai tecnici, ma anche a un pubblico non esperto. La metodologia deve essere strutturata per identificare chiaramente le problematiche principali, categorizzarle e fornire indicazioni operative per un intervento consapevole e mirato.

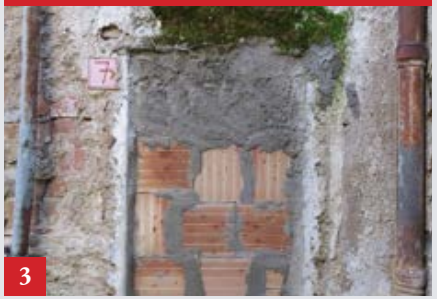
S/T

1

F

2

DU



3

1. Infissi esterni verticali: Mancanza di infissi;

2. Partizioni interne: Crollo del solaio di interpiano;

3. Infissi esterni verticali: Chiusura del vano finestra;

R

1

Ms

2

Ms

3

1. Sistemi per il convogliamento dei fumi: Canna fumaria non integrata nel prospetto, da tinteggiare;

2. Pareti perimetrali verticali: Presenza di patina biologica nel prospetto, da ripristinare;

3. Pareti perimetrali verticali: Alterazione cromatica, da tinteggiare;

1

2

3

1. Manto di copertura: Copertura conforme alle peculiarità tecnico-costruttive dell'area;

2. Pareti perimetrali verticali: Paramento murario ben recuperato;

3. Pareti perimetrali verticali: Casa terrana con paramento murario a faccia vista, ben conservato;

Rilievo fotografico; ©Luisa Lombardo, 2023

Analisi delle coperture di Polizzi Generosa

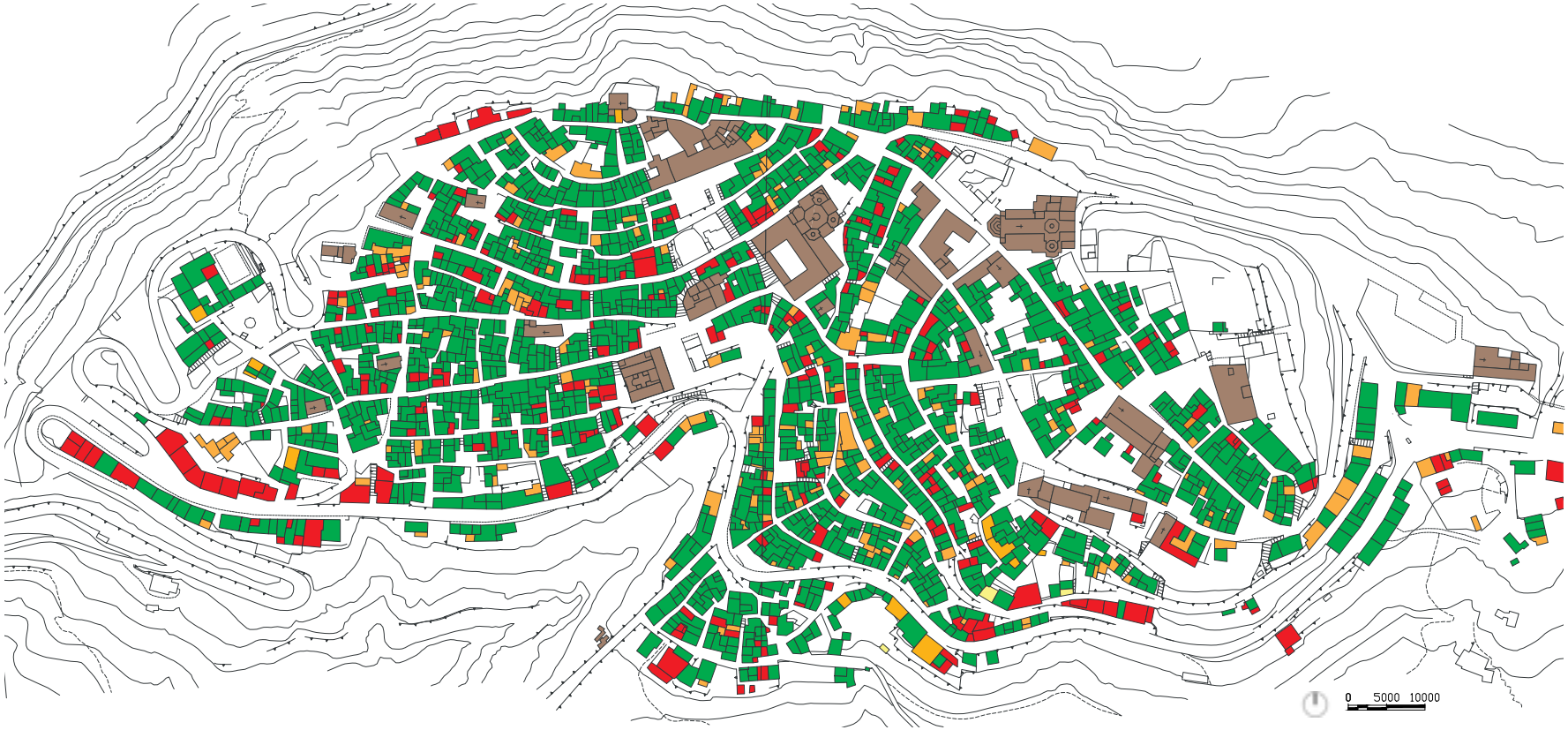


Tavola tematica della vulnerabilità delle coperture del centro storico di Polizzi Generosa; ©Luisa Lombardo, 2023

L'analisi può essere effettuata anche a grande scala, si sono analizzate, pertanto, le coperture del centro storico. Grazie alle foto dal drone è stato possibile constatare il loro stato di fatto ed identificare gli errori esecutivi rispetto alla tradizione costruttiva locale. In particolare, secondo quanto detto nelle sezioni precedenti, sono tantissime le coperture presenti non conformi a quelle tradizionali in coppi. Alterate non solo da una tecnologia ben diversa, ma anche da presidi tecnologici, i più comuni i pannelli solari, cisterne per l'acqua o antenne, ma anche verande e tettoie, che compromettono un'armoniosa visione non solo del paesaggio urbano, ma anche di quello naturale immediatamente vicino.

S/T

1

F

2

DU

3

1. Manto di copertura: Copertura piana, tecnologicamente errata;

2. Chiusura orizzontale: Crollo della copertura e perdita della sua funzione madre;

3. Manto di copertura: Copertura non ricoperta da coppi;

R

1

M

2

T

3

1. Superfetazione aggiunta: Veranda in copertura, da rimuovere;

2. Protezione lastrici solari: Tettoia in lamierino e non in coppi, da modificare;

3. Manto di copertura: Colore e materiale della copertura non conforme ai caratteri tecnico-costruttivi dell'architettura di base;

1

2

3

Le tre coperture sono tre esempi virtuosi di coperture che rispettano la giacitura e che utilizzano un manto di copertura in coppi siciliani;

Rilievo fotografico; ©Luisa Lombardo, 2023

Analisi delle pavimentazioni esterne di Polizzi Generosa

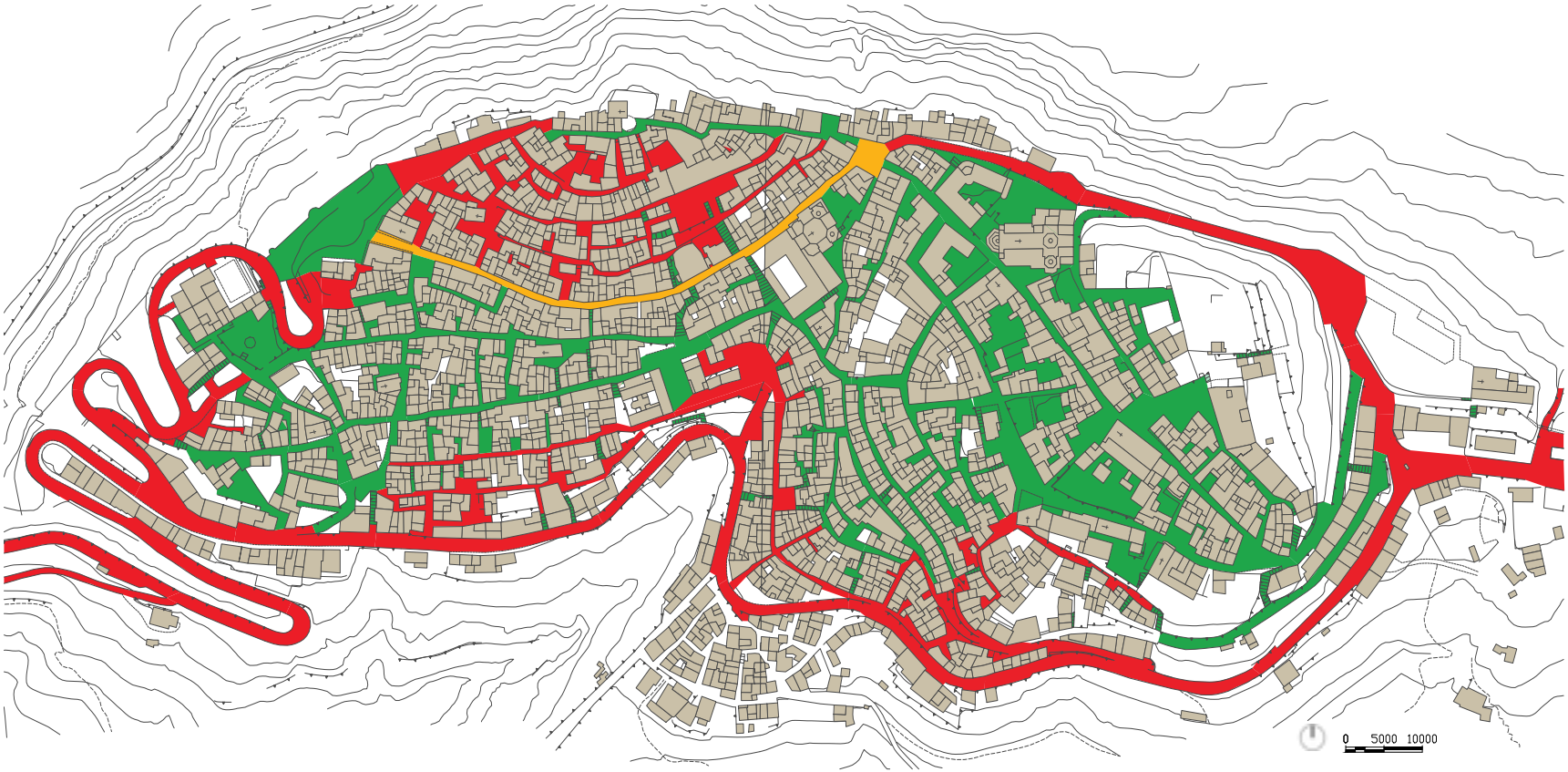


Tavola tematica della vulnerabilità del basolato del centro storico di Polizzi Generosa; ©Luisa Lombardo, 2023

Infine, per una maggiore comprensione della metodologia utilizzata, la medesima analisi è stata condotta anche sulle pavimentazioni esterne del centro storico. Per garantire i caratteri identitari del borgo, si prescive il più possibile il mantenimento delle pavimentazioni originarie, prive di interruzioni e con una continuità sia materica che tecnologica. Si presenta, infatti, colmo di porzioni di pavimentazione non idonee e conformi ai criteri di decoro urbano e non conformi alle antiche tecnologie utilizzate nel passato, bitume o asfalto e basolato in pietra lavica (non presente nell'area delle Madonie) sono pertanto da attenzionare e da sottoporre ad interventi mirati. L'obiettivo delle linee guida è portare Polizzi ad una condizione quanto più vicina al colore "verde".

S/T

1

F

2

DU

3

1. Pavimentazione esterna: Assenza di pavimentazione storica, da ripristinare;

2. Pavimentazione esterna: Frattura del bitume, pavimento parzialmente carrabile; sa rimuovere e ripristinare;

3. Pavimentazione esterna: Presenza di vegetazione e possibile sdrucciolamento, da rimuovere e ripristinare;

R

1

Ms

2

Ms

3

1. Pavimentazione esterna: Basolato in pietra lavica, materiale non locale per cui è necessaria la rimozione e sostituzione;

2. Pavimentazione esterna: Presenza di vegetazione nella pavimentazione, da mantenere;

3. Pavimentazione esterna: Pavimentazione storica ricoperta da bitume, da rimuovere e ripristinare;

1

2

3

Le tre soluzioni individuate rappresentano tre basolati storici dell'area madonita e non necessitano di alcun intervento salvo quelli manutentivi necessari a favorire la loro fruizione e conservazione nel tempo.

Rilievo fotografico; ©Luisa Lombardo, 2023

4_Patrimonio protetto e Gradi di intervento

Patrimonio protetto

[1]Il Piano Regolato Generale del Comune di Polizzi Generosa è stato redatto il 30 Settembre 1988.
Esso individua, non solo la zonizzazione dell'intero centro abitato, ma classifica l'edilizia presente in categore quali Edifici di interesse storico - monumentale da sottoporre a vincolo ai sensi della Legge 1/06/1939 N° 1089 e poi in A, A1, B e C, rispettivamente edilizia Storica (A e A1), di completamento (B) e di espansione (C).

[2]I vincoli derivano dal Codice dei beni culturali e del paesaggio coordinato ed aggiornato, da ultimo, con le modifiche introdotte, dalla L. 9 marzo 2022, n. 22 e dal D.L. 24 febbraio 2023, n. 13, convertito, con modificazioni, dalla L. 21 aprile 2023, n. 41.

Tutto il comprensorio di Polizzi Generosa, nel grande Parco delle Madonie, è all'interno del vincolo paesaggistico, parte anche nel vincolo archeologico.

Ciascun Comune siciliano è provvisto di P.R.G.[1] che individua le principali vie di comunicazione, la divisione del territorio di competenza in zone omogenee, le norme attuative; le zone dedicate a edifici pubblici ed i vincoli paesaggistici e di carattere Storico - Monumentale[2], opportunamente censiti dalla Soprintendenza al fine tutelarli, preservarli e conservarli.

Per il recupero e la valorizzazione del Comune di Polizzi, pertanto, si identificano dei livelli di protezione legati alla classificazione effettuata dal PRG e, a ciascun livello, è poi assegnato un grado di protezione specifico volto all'individuazione degli interventi possibili o meno.

Ad ogni edificio presente sono assegnati livelli di categorizzazione a seconda se questi sono BIC, Beni di Interesse Culturale, importanti per la loro storicità a livello regionale e nazionale, o BRL, Beni di Rilevanza Locale, ovvero tutti quegli edifici depositari di un grande capitale culturale per Polizzi Generosa. È incluso anche il resto

La metodologia proposta consente una progettazione virtuosa con criteri di recupero e valorizzazione che comportano ad una conservazione del patrimonio costruito preservando e valorizzando l'identità locale in base alla storicità riscontrata.

Vicolo Moschea; ©Luisa Lombardo, 2023

[1]I livelli di categorizzazione corrispondono alle tipologie di edifici presenti nel territorio e si riferiscono alla suddivisione del P.R.G.
Ad ogni livello proposto (in numero uguale alla suddivisione del Piano Regolatore vigente) corrisponde un grado di protezione differente che può essere integrale, tipologico-strutturale, ambientale, singola o ambientale di II livello.
I livelli vanno da 1 a 4, dal livello di protezione maggiore al minore, poiché si riferiscono, in primo luogo, agli edifici di interesse storico monumentale, fino all'edilizia più recente e in Categoria B, dunque sottoposta ad un livello di protezione più basso.

[2]I gradi di protezione, invece, sono l'insieme degli interventi permessi, condizionati o proibiti, volti ad ottenere un patrimonio costruito ben conservato rispettando i caratteri dell'architettura storica.

LIVELLI DI CATEGORIZZAZIONE[1]

Livello 1 - BIC
È il livello massimo di protezione ed è per gli edifici di Interesse storico - monumentale, pertanto, tiene un maggior grado di protezione. È inclusa in questo livello tutta l'edilizia religiosa e non considerata Bene di Interesse Culturale (BIC) del Comune di Polizzi Generosa.

Livello 2 - Categoria A
Corrisponde all'edificazione residenziale più antica e che mantiere le caratteristiche originarie dell'edilizia di base di Polizzi Generosa conservando uno stato di conservazione accettabile per il suo possibile recupero. Alcune di queste hanno subito interventi di recupero negli ultimi anni, mentre altre sono in stato di decadimento e/o degrado avanzato.

Livello 3 - Categoria A1
In questo livello si include quell'edilizia che, sebbene abbia avuto come riferimento l'edilizia storica più antica di Polizzi Generosa (A), siano state costruite in tempi più recenti, mantenendo tuttavia le caratteristiche base.
Tuttavia, possiedono un interesse architettonico per la loro tipologia e caratteristiche tecnico-costruttive sempre legate alla storia di Polizzi Generosa.

Livello 4 - Categoria B
Con questo livello si catalogano gli edifici recenti costruiti in seguito ai fabbricati di Categoria A e A1 che non posseggono particolare interesse storico, ma che mantengono una relazione neutra con l'intorno.

L'edilizia presente, pertanto, può essere catalogata in Livelli 2, 3 o 4 e ad ognuno di questi livello corrisponde una protezione che sarà garantita attraverso la possibilità di realizzare determinati interventi.

GRADI DI PROTEZIONE[2]

I gradi di protezione che prevede questo Linee Guida del Centro Storico di Polizzi Generosa stabiliscono che per l'edilizia catalogata sono i seguenti:

- Protezione Integrale (P.I.)
- Protezione Tipologica - Strutturale (P.T.)
- Protezione Ambientale - 1 (P.A. - 1)
- Protezione Singola (P.S.)
- Protezione Ambientale - 2 (P.A. - 2)

I gradi di protezione corrispondono alla tipologia di interventi permessi, condizionati o proibiti, le cui caratteristiche vengono definite nell'apparato seguente.

La Protezione Integrale si stabilisce per gli edifici del Livello 1, la Protezione Tipologica - Strutturale per l'edilizia del Livello 2, La Protezione Ambientale - 1 e la Protezione Singola per gli edifici del Livello 3 e la Protezione Ambientale - 2 per il Livello 4

Interventi relativi agli edifici catalogati

Il piano previsto definisce i tipi di interventi edilizi, limitantoli in funzione del livello di catalogazione di cui si tratta.

Per l'edilizia catalogata si distinguono i seguenti tipi di intervento:

- Conservazione
- Consolidamento
- Restauro
- Recupero
- Ricostruzione
- Demolizione
- Nuova costruzione

1. Conservazione

Sono opere necessarie per mantere l'immobile in buono stato, evitando la formazione di degradi di prodotti dagli agenti atmosferici, per l'utilizzo e la manutenzione dello stesso, senza che si effettui la sostituizione di elementi strutturali, la variazione delle caratteristiche volumetriche e dimensionali.
Sono opere la cui finalità è compire agli obblighi di proprietà in quanto si riferisce alle condizioni del decoro e igiene dell'edificio.
Nei casi di edilizia pubblica, la piena responsabilità ricade sull'amministrazione, in caso di edificio privato, invece, al proprietario.
Si considerano all'interno di questo quadro:

- Eventuali riparazioni di tutti quegli elementi o impianti che si considerano in cattivo stato come: coperture, grondaie e pluviali, sanitari, carpenteria, ecc...

2. Consolidamento

Sono opere necessarie ad evitare la distruzione o il crollo di un edificio, o parte di esso, senza alterare le sue caratteristiche.
Sono opere di consolidamento e rinforzo degli elementi strutturali o riparazioni degli elementi considerati deboli per cui è possibile esaurirsi la durabilità dello stesso.

3. Restauro

Sono opere necessarie affinchè l'edificio recuperi il suo aspetto caratteristico originale o riveli il suo valore estetico o storico in accordo alla metodologia scientifica e alla conoscenza della sua situazione primitiva, sempre che sia possibile.
È permessa l'eliminazione degli elementi impropri e il recupero degli elementi autentici.
Sono quando sono presenti resti o prove documentate certe e in caso di giustificazioni, sarà possibile effettuare modifiche per la creazione di un nuovo disegno che deve essere riconoscibile, evitando confusioni mimetiche e realizzato sempre con il massimo rispetto del manufatto architettonico.
In caso di riconfigurazione delle condizioni originali, si include la riparazione o la sostituzione degli elementi strutturali o sistemi per l'adeguamento adeguando il funzionamento dell'edificio in relazione alla necessità e all'uso a cui è destinato.
I processi di restauro rispettano i contributi di tutte le epoche esistenti. L'eliminazione di alcune testimonianze più essere autorizzata solo con carattere eccezionale e sempre che gli elementi evidenzino degradi, la loro eleminazione dovrà essere necessaria per permettere una migliore lettura e interpretazione storica dello stesso. Le parti soppresse devono essere debitamente documentate.

4. Recupero

Opere che tendono a dotare l'edificio di una funzionalità e di condizioni idonee per un uso che può essere diverso dall'originale.
Si possono ammettere opere che permettono il suo utilizzo, migliorare il suo grado di abitabilità, che possono implicare variazioni strutturali dei vani interni, adeguamento delle facciate e delle coperture che non si traducano in un cambiamento del valore proprio dell'edificio.
Solo nel caso in cui sia permesso, è possibile considerare l'apertura di patii interni che migliorino le condizioni di illuminazione e ventilazione, si permettono variazioni strutturali per la costruzione di un nuovo muro della facciata posteriore.
Le opere saranno di riparazione, sostituzione o implementazione di impiantistica, ridistribuzione spaziale con la modifica delle partizioni, sostituzione interna di pavimenti, rivestimenti, carpenterie e sistemi metallici, apertura dei vani di accesso, luci e ventilazioni a patii, sostituzione di coperture e costruzione di nuove scale, sempre che non modifichino o alterino il valore architettonico dell'edificio. In caso di destinazione d'uso differenti dal residenziale, si potranno realizzare nuovi pavimenti, soppalchi e opere analoghe a patto che non alterino le caratteristiche che motivano la protezione dell'edificio.

5. Ricostruzione

Sono opere volte alla riedificazione o ricostruzione di un edificio distrutto, di forma identica al suo stato originario. Il processo deve avvenire rispettando le caratteristiche delle tecniche tradizionali locali, delle volumetrie, delle sagome e della conformazione originaria.

6. Demolizione

La demolizione totale di un edificio di scarso interesse o dichiarato in stato di rovina e/o crollo per la sua sostituzione o meno.

7. Nuova costruzione

Riguarda la sostituzione totale di un edificio di scarso interesse, o in situazione irrecuperabile, per un altro di sana pianta, in condizioni migliori, integrandolo nel costruito storico. In questi casi il Piano di Recupero, definito attraverso il RE e il CDBP, tutti i parametri e le condizioni di edificabilità del nuovo edificio (altezze, profondità edificabile, numeri di piani, coperture, balconi e facciata) così come l'obbligo di recuperare, se esiste, qualsiasi elemento di interesse puntale dell'edificio che si sostituisce, devono essere rispettati.
L'opera di nuova costruzione sarà individuata come di carattere non vincolante e che, nel caso di edificazione, avrà Livello 4.
La sostituzione sarà vincolata sempre che si presenti una soluzione alternativa che contribuirà maggiormente a preservare il carattere e che sia di maggiore interesse rispetto all'elemento sostituito.
Gli elementi puntuali da conservare devono essere integrati e con forma concorde al nuovo disegno.
Per la licenza di costruzione sarà necessario presentare tutti i documenti tecnici relativi al progetto, piante, prospetti, sezioni, restituzione fotografica e tutto ciò che serve per giustificare la proposta progettuale, prima in Soprintendenza e poi presso gli Uffici Tecnici Comunali.

Chiesa di San Girolamo; ©Luisa Lombardo, 2023

Quadro riassuntivo dei gradi di intervento e tavole grafiche

CATALOGAZIONE	PROTEZIONE	GRADO DI INTERVENTO		
		Interventi permessi	**Interventi condizionati**	**Interventi proibiti**
Livello 1	Protezione integrale	Conservazione Consolidamento Restauro	Recupero parziale Recupero totale Riutilizzo	Demolizione Sostituzione Opera nuova
Livello 2	Protezione tipologica - strutturale	Conservazione Consolidamento Restauro Recupero	Ristrutturazione Recupero parziale Riutilizzo Demolizione parziale	
Livello 3	Protezione ambientale 1	Conservazione Consolidamento Restauro Recupero Ristrutturazione Demolizione interna	Opera nuova Riutilizzo Demolizione Ristrutturazione della facciata	
	Protezione singola			
Livello 4	Protezione ambientale 2	Conservazione Consolidamento Restauro Recupero Ristrutturazione	Opera nuova Demolizione Sostituzione	

I beni censiti dalla Soprintendenza BB.CC.AA. di Palermo

Tavola tematica dei beni censiti dalla Soprintendenza; ©Luisa Lombardo, 2023

Polizzi Generosa è ricca di monumenti, grazie alla sua storia ricca di dominazioni, tanto da essere appellata la "Firenze delle Madonie". È il comune madonita con più beni architettonici e monumentali presenti nell'area, a titolo di esempio, si pensi che rimangono 34 delle 80 chiese un tempo presenti.

Sono almeno 60 i beni monumentali nel territorio, alcuni ancora in ottime condizioni, altri demoliti e persi nel corso dei secoli, di cui rimangono soltanto poche tracce. Sono stati catalogati dalla Soprintendenza BB.CC.AA. di Palermo, in apposite schede CSU, al fine di tutelarli e valorizzarli, ma anche promuovere un contesto abitativo che abbia contezza delle radici passate e che sorvegli ciò che è presente o era presente nell'area. Luoghi che rendono questo ambito urbano importante non solo per la storia dei siciliani, ma anche per l'intero Paese, e per questo da ricordare.

Livelli di catalogazione e gradi di protezione

LIVELLO 1 LIVELLO 2 LIVELLO 3 LIVELLO 4

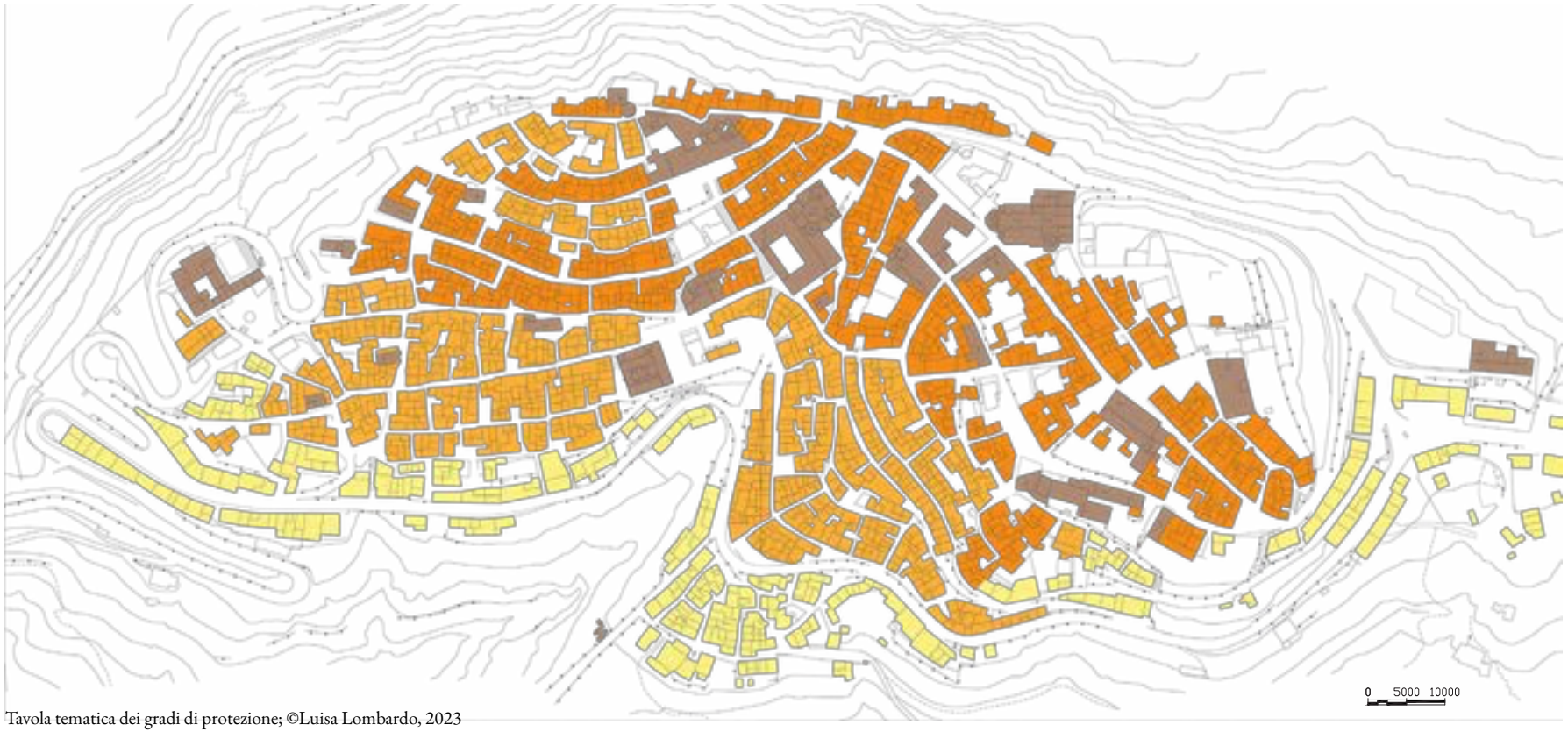


Tavola tematica dei gradi di protezione; ©Luisa Lombardo, 2023

In base alla suddivisione del PRG, ciascun edificio è stato categorizzato attribuendogli un livello differente, dal 1 al 4, che individua il grado di protezione degli stessi. Tranne gli edifici BIC presenti nel territorio, alcune tracce del passato sono presenti all'interno degli altri livelli. Qualora l'intervento riguardi un edificio di livello diverso dal n°1, ma risulta censito dalla Soprintendenza ed è dunque nell'elenco ufficiale degli edifici sottoposti a vincolo, si opterà, solo ed unicamente per quel bene, per la protezione massima con Livello 1 al fine di tutelarlo e conservarlo.

Per tutti gli altri edifici, si applicano gli interventi di restauro, recupero o ricostruzione rispetto al Livello a cui appartengono.

1) Chiesa Madre (Beata Vergine Assunta), 1690 (sui precedenti impianti minori del 1083; portico laterale del 1486-1521, portale del 1700:

2) Chiesa della SS. Trinità (già Chiesa madre) dall'ordine dei religiosi cavalieri di S. Maria dei Teutoni, 1303;

3) Ex Ospedale della SS. Trinità (poi della SS. Annunziata), 1400 (su precedente impianto del sex XIV o precedente; dal 1591 al 1866 Ospedale dei Frati Fatebenefratelli di S. Giovanni di Dio; demolito);

4) Palazzo La Farina (poi Gugliano - Porcara), sec. XVI;

8) Palazzo Gagliardi Barone di Carpinello della Regia Secrezia, sec. XVII;

9) Chiesa di S. Pancrazio, 1570, fu capo di capitaneria centro spirituale dei Bizantini sino a tutto il sec. XVI. Non è databile, ma probabilmente è anteriore all'occupazione Araba (ampliamenti del 1611; oggi abbandonata).

10) Torre, sec. XVI (su precedente impianto);

11) Chiesa di S. Giorgio chiamata dal '700 dell'Udienza. Fu capo di capitaneria, sec XVII (su precedente impianto: rito greco).

12) Chiesa di S. Maria Lo Piano (o di Gesù o del Soccorso) esistente prima del 1301 (rimaneggiamenti del sec. XVIII e successivi.

13) Chiesa della SS. Trinità dell'Ordine dei Religiosi Cavalieri di S. Maria dei Teutoni, 1303 (sconsacrata, oggi garage);

14) Oratorio del SS. Rosario, 1555 (parzialmente demolita);

15) Chiesa di S. Spirito, inizi del sec. XV (parzialmente crollata), annessa al convento dei Domenicani e oratorio della Madonna del Rosario. Il convento fu costruito nel 1496 accanto alla chiesa che già esisteca; l'oratorio è del 1555;

16) Convento dei PP. Domenicani, 1469-1549 (dismesso, manomissioni e trasformazioni d'uso recenti);

19) Chiesa di S. Antonio Apostolo, 1361 (su precedente impianto arabo; trasformazioni del sec. XVII);

20) Chiesa di S. Maria degli Schiavi (o della Porta), 1672 (su precedente impanto);

21) Chiesa di S. Orsola 1570 (sul precedenre impianto minore della chiesa di S. Maria di Presti Michele del 1386);

23) Chiesa di Maria di Gesù (o di S. Maria degli Angeli, 1661);

24) Ex convento dei Frati Minori Osservanti, 1661 (dismesso; dal 1913 Ospedale civico, demolito e ricostruito);

26) Palazzo Porcaro, sec. XVIII;

27) Chiesa di S. Girolamo, 1681-1730 (col titolo di San Domenico dal 1767 al 1805;

28) Collegio dei PP. Gesuiti, 1681-1730 (dal 1767 al 1805 dei PP, Domenicani, dal 1805 al 1866 ancora dei PP. Gesuiti; oggi Municipio);

29) Chiesa di S. Caterina, 1750;

33) Palazzo signorile, sec. XVIII;

34) Chiesa di S. Gandolfo (detta La Povera), 1622 (sui precedenti impianti della Chiesa e dell'Ospedale di S, Cecilia esistenti nel 1386);

35) Collegio di Maria, 1786 (sul precedente impianto della "Casa del Vescovo" del sec, XVII-XVIII; dal 1913 diretto dalle Suore Missionarie Francescane del Bambino Gesù);

37) Resti di portale, sec, XVIII;

38) Chiesa di S. Maria delle Grazie, fine del sec, XV (rimaneggiamenti del 1793);

42) Ex Chiesa di S. Maria Maddalena, 1315-1386 (dal 1558 aggiunto il titolo di S, Giovanni Battista;

demolita nel 1892 per la costruzione della carrozzabile Collesano-Polizzi);

43) Chiesa di S. Agostino (già S Giovanni B,del Ponte), sec. XIII(dal 1580 Commenda della Camera Magistrale del Priorato di Messina dei Cav. di Malta, dismessa nel 1866, rudere);

45) Chiesa di S. Nicolò dei Franchi, 1167 (rimaneggiamenti del sec. XVI; già annessi Ospedale e Ospizio omonimi,poi inglobati nel Monastero di S, Margherita);

46) Chiesa di S. Margherita, sec, XVII (su precedente impianto);

47) Ex Monastero di S. Margherita delle Suore Benedettine, 1323-1327 (demolito e sostituito da edilizia del sec, XX);

48) Chiesa di S. Francesco d'Assisi, sec, XIV (restauri receenti);

49) Convento dei Frati minori Conventuali di S. Francesco, sec. XIV (dismesso nel 1860);

50) Chiesa di Maria SS. Annunziata, sec. XV (in rovina);

53) Chiesa della Madonna della Misericordia (poi della Madonna del Carmelo), sec. XV (rimaneggiamenti dei secc, successivi);

54) Ospedale di S. Giuliano e Convento dei PP. Domenicani, 1420 (dal 1549 dei PP, Carmelitani Riformati di Monte Santo; demolizioni parziali e rifacimenti del sec, XX);

55) Acquedotto, 1476-1480 (resti);

57) Palazzo Maretta Barone di S. Agata (poi Migliozzi Dagnino), sec. XVIII (su precedente impianto);

58) Palazzo Gagliardo di Casalpietro, sec, XVII;

59) Ex Chiesa della Madonna del Castello (chiusa al culto nel 1897; sconsacrata nel 1918, oggi ruderi);

60) Mura di Città, sec, VII-XI (rimaneggiamenti del sec. XIV);

62) Castello di Ruggero, sec. XII (resti delle torri quadrangolari e della cortina muraria perimetrale).

Chiesa dei Sette Angeli; ©Luisa Lombardo, 2023

5) Palazzo Rampolla - Caracciolo sec. XVIII (resti di facciata e delle strutture murarie interne);

6) Ex Chiesa della Madonna dell'Odigitria 1589 (chiusa al celto nel 1892, oggi inglobata in costruzioni recenti;

7) Palazzo Sponselli, sec. XVII (resti);

22) Palazzo Signorile, 1885 (su precedente impianto);

25) Convento di S. Giovanni Apostolo, (dismesso, oggi esercizio commerciale);

30) Orfanotrio di S. Caterina (o Badia Piccola), inizi del sec. XVII (dismesso nel 1786);

31) Palazzo signorile, sec, XVIII;

32) Palazzo Porcaro, sec, XIX;

36) Resti di balcone, sec. XV;

39) Monastero delle suore Benedettine di S. Maria delle Grazie (detto Badia Grande), 1499 (sui precedenti impianti della Chiesa di S, Mattéa e del Palazzo Signorino);

40) Palazzo signorile, sec. XVIII (resti);

44) Palazzo Fatta, sec. XVIII;

51) Ex Convento dei FF. Minori Cappuccini, 1644 (dismesso nel 1866, demolito e sostituito da edilizia abitativa del sec, XX);

56) Ex Chiesa (demolita).

Fanno parte di questa lista tutti gli edifici individuati come "Zona omogenea a prevalente destinazione d'uso residenziale" dal P.R.G.
Storica **"Categoria A"**

Chiesa dei Sette Angeli (in alto a destra), Chiesa di San Girolamo (in basso a sinistra); Chiesa della SS. Trinità dell'Ordine dei Religiosi Cavalieri di S. Maria dei Teutoni ©Luisa Lombardo, 2023

EDILIZIA CATALOGATA CON LIVELLO 3
Elenco degli edifici censiti dalla Soprintendenza BB.CC.AA. di cui si propone il vincolo ai sensi della L. 1/06/39 N° 1089

18) Ex Chiesa di S. Biagio, sec. XIII (demolita nel 1838);

41) Resti di Portale, sec. XVI;

Fanno parte di questa lista tutti gli edifici individuati come "Zona omogenea a prevalente destinazione d'uso residenziale" dal P.R.G.
Storica "**Categoria A1**"

EDILIZIA CATALOGATA CON LIVELLO 4
Elenco degli edifici censiti dalla Soprintendenza BB.CC.AA. di cui si propone il vincolo ai sensi della L. 1/06/39 N° 1089

17) Ex Chiesa del SS. Salvatore, 1554 (rudere del sec. XIX sostituita da edilizia abitativa del sec. XX);

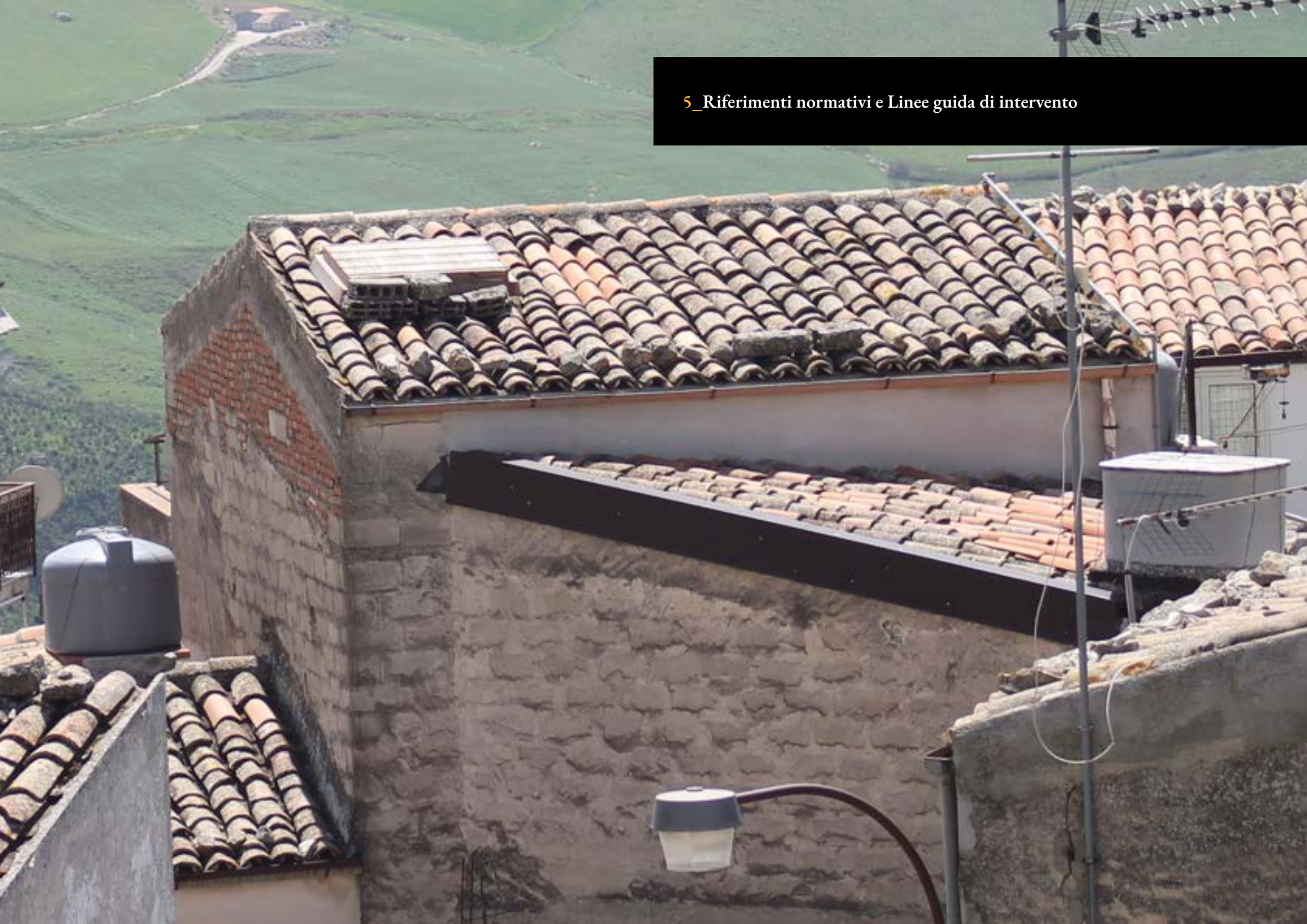
52) Ex Chiesa della Madonna delle Grazie, inizi del sec, XVI (ricostruita nel 1618; demolita nel sec. XX);

61) Ex Porta Grande (demolita);

Fanno parte di questa lista tutti gli edifici individuati come "Zona omogenea a prevalente destinazione d'uso residenziale" dal P.R.G.
Di completamento "**Categoria B**"

		INTERVENTI PERMESSI	INTERVENTI CONDIZIONATI	INTERVENTI PROBITI
LIVELLO 1	**PROTEZIONE INTEGRALE**	Conservazione Consolidamento Restauro	Recupero parziale Recupero Riutilizzo	Demolizione Sostituzione Opera nuova
LIVELLO 2	**PROTEZIONE TIPOLOGICA / STRUTTURALE**	Conservazione Consolidamento Restauro Recupero	Ristrutturazione Recupero parziale Riutilizzo Demolizione parziale Riutilizzo	Demolizione Sostituzione Opera nuova
LIVELLO 3	**PROTEZIONE AMBIENTALE 1**	Conservazione Consolidamento Restauro Recupero Ristrutturazione Demolizione interna	Opera nuova Riutilizzo Demolizione Sostituzione della facciata	
LIVELLO 3	**PROTEZIONE SINGOLARE**			
LIVELLO 4	**PROTEZIONE AMBIENTALE 2**	Conservazione Consolidamento Restauro Recupero Ristrutturazione	Opera nuova Demolizione Sostituzione	

5_Riferimenti normativi e Linee guida di intervento



Da Via Vinciguerra; ©Luisa Lombardo, 2023

[1] Codice dei beni culturali e del paesaggio
(D.Lgs. n. 42/2004 coordinato ed aggiornato, da ultimo, dalla L. 21 aprile 2023, n. 41)
Sono beni paesaggistici:
a) gli immobili e le aree di cui all'articolo 136, individuati ai sensi degli articoli da 138 a 141;
b) le aree di cui all'articolo 142;
c) gli ulteriori immobili ed aree specificamente individuati a termini dell'articolo 136 e sottoposti a tutela dai piani paesaggistici previsti dagli articoli 143 e 156.

Il Codice dei Beni Culturali e del Paesaggio[1] è il principale riferimento normativo italiano che attribuisce al Ministero per i beni e le attività culturali il compito di tutelare, conservare e valorizzare il patrimonio culturale italiano.
Il Codice invita alla stesura di piani paesaggistici meglio definiti come "piani urbanistici territoriali con specifica attenzione ai valori paesaggistici".

Il Codice individua, pertanto, la necessità di preservare il patrimonio culturale italiano, definendo come bene culturale le cose immobili e mobili che presentano interesse artistico, storico, archeologico o etnoantropologico.

Rientrano, inoltre, in tale definizione i beni architettonici, le raccolte di istituzioni culturali (quali museali, archivi e biblioteche), i beni naturalistici (quali i beni mineralogici, petrografici, paleontologici e botanici) e storico scientifici, le carte geografiche, nonché materiale fotografico (fotografia e negativo) e audio-visivo (pellicola cinematografica).

Vengono altresì considerati di interesse culturale i beni immateriali e i beni paesaggistici.

Tutto il territorio comunale di Polizzi Generosa è sotto vincolo paesaggistico, e parte sotto vincolo archeologico, pertanto, ogni alterazione effettuata nel territorio, inteso come patrimonio naturale e costruito, deve seguire un iter rigido di permessi da acquisire e sottostare, al contempo, anche la Regolamento Edilizio vigente nel Comune.

L'obiettivo della normativa è preservare un'area, come quella di Polizzi Generosa, e più in generale l'area del Parco delle Madonie, in cui si incontrano natura, storia, arte e cultura antica.

Le pratiche e le istanze degli interventi previsti e da eseguire, prima di essere presentate all'ufficio tecnico del Comune, devono essere validate da parte dell'organo della Soprintendenza al fine di valutare l'impatto ambientale della soluzione proposta.

Ciò vale sia per il recupero di manufatti esistenti, ma soprattutto per casi di "nuova costruzione". Senza il benestare della Soprintendenza, il Comune non può permettere l'inizio dei lavori, pertanto, l'opera si considera non realizzabile, anche se di piccola entità.

Risulta, dunque, opportuno, presentare con largo anticipo, rispetto ai tempi di esecuzione dell'opera previsti, tutti gli elaborati, quali piante, prospetti, sezioni, fotoinserimenti, rendering e prove di colore volti alla comprensione dell'opera da realizzare.

Risulta altresì necessario considerare, in fase di progetto, un recupero virtuoso del manufatto architettonico, vicino alle peculiarità e ai sistemi costruttivi tipici dell'area; in caso contrario, e, dunque, se l'opera non soddisfa i criteri di recupero e valorizzazione richiesti dall'Ente, sarà rigettata dagli uffici preposti e sarà necessario optare per una rielaborazione e riformulazione degli elaborati da presentare. Questo comporterà la presentazione della pratica ex novo.

Regolamento edilizio del Comune di Polizzi Generosa

Il Regolamento Edilizio (RE) è lo strumento normativo e non urbanistico che norma a livello comunale le modalità costruttive dell'edificazione, garantendo il rispetto delle normative tecnico-estetiche, igienico-sanitarie, di sicurezza e vivibilità degli immobili e delle pertinenze degli stessi.

Disciplina, all'interno dell'intero territorio comunale, ogni attività comportante trasformazione urbanistica ed edilizia, contiene disposizioni per la tutela dei valori ambientali e architettonici, per il decoro e la qualità urbana ed edilizia, per l'igiene e la sicurezza cittadina.

In linea generale il contenuto dei regolamenti edilizi è stabilito dall'art.33 della Legge Urbanistica, che elenca una serie di materie che devono essere specificatamente disciplinate. Ciò significa che ogni Comune può adottare norme anche in materie diverse da quelle previste nell'articolo predetto, sempre che riguardino l'attività edilizia.

Il Regolamento Edilizio nel dettare norme deve distinguerle a seconda che riguardino:

- Il nucleo edilizio esistente;
- Le zone di ampliamento dell'abitato;
- Il restante territorio comunale.

Le norme regolamentari possono dividersi in tre gruppi:

- **Norme di procedura**, riguardanti la composizione, la competenza ed il funzionamento dei vari organi e uffici cui è attribuita la disciplina urbanistica, la licenza di costruzione, la progettazione, la esecuzione e la vigilanza dei lavori;
- **Norme di carattere urbanistico,** riguardanti la distanza e l'altezza dei fabbricati, i tracciati stradali, la tipologia degli edifici secondo le zone di territorio, l'aspetto estetico degli stessi;
- **Norme di carattere igienico-sanitario**, riguardanti le dimensioni delle costruzioni ed i servizi tecnici, igienici e l'osservanza delle prescrizioni relative ai materiali da costruzione.

La funzione del RE è complementare alla disciplina urbanistica, ma non sostituirsi ad essa. Le sue disposizioni, anche se in qualche caso contengono prescrizioni tecniche, sono in prevalenza di ordine giuridico-amministrativo.

Le limitazioni imposte dai regolamenti edilizi sulle altezze, sulle distanze, sul volume degli edifici, essendo diretti alla tutela degli interessi pubblici, sono inderogabili da parte dei privati, i quali devono uniformarsi sotto pena di sanzioni che possono giungere all'abbattimento di quanto costruito contro le prescrizioni.

Il regolamento edilizio si applica a tutto il territorio comunale nel momento stesso in cui entra in vigore.

La parte seguente del volume effettua la disamina dello stato dell'arte del patrimonio costruito di Polizzi Generosa affiancato dalle normative vigenti, ovvero il CBCP e il RE.

Dalla problematica evidenziata, si suggerisce la tipologia di intervento da effettuare in base al grado di vulnerabilità e le possibili modifiche da apportare per il recupero e la valorizzazione del centro storico.

Edifici del Centro Storico; ©Luisa Lombardo, 2023

RAU - Regolamento Comunale Arredo Urbano: norme di valorizzazione e di gestione del paesaggio urbano

Il Regolamento Comunale per l'Arredo Urbano (RCAU) è un atto normativo fondamentale che regola l'installazione e la manutenzione dell'arredo urbano all'interno del Comune di Polizzi Generosa.

L'arredo urbano comprende elementi come panchine, cestini, lampioni, segnaletica, fontane e altri elementi che caratterizzano l'ambiente urbano.

Lo scopo principale del RCAU è assicurare la valorizzazione e la gestione del paesaggio urbano attraverso la definizione di regole e procedure specifiche per l'installazione e la manutenzione dell'arredo urbano.

Tra gli aspetti regolamentati dal RCAU vi sono:

- Tipologie di arredi urbani ammessi: Il RCAU stabilisce le tipologie di arredi urbani che possono essere installate nel Comune, basandosi su criteri di sicurezza, funzionalità ed estetica.
- Procedura per l'installazione di arredi urbani: Il RCAU prevede una procedura autorizzativa per l'installazione di arredi urbani, sia da parte di privati che di enti pubblici.
- Manutenzione dell'arredo urbano: Il RCAU impone l'obbligo di manutenzione dell'arredo urbano, responsabilità che può ricadere sul Comune o sul proprietario.

Questo regolamento è cruciale per la gestione e la valorizzazione dell'ambiente urbano, contribuendo a migliorare la qualità della vita dei cittadini e a rendere gli spazi pubblici più confortevoli e accessibili.

Nel caso specifico di Polizzi Generosa, il RCAU è stato approvato dal consiglio comunale con l'obiettivo di valorizzare il contesto urbano del comune. Le disposizioni del regolamento mirano a preservare il centro storico in modo decoroso, considerando aspetti ambientali, storico-architettonici, culturali e turistici. Gli allegati al regolamento forniscono ulteriori dettagli, compresi ambiti urbani unitari, un abaco dell'arredo urbano e specifiche zone del centro storico soggette a norme particolari, fornendo una guida dettagliata agli interventi e alle procedure previste.

- L'**Allegato A** individua il centro storico quale zona della città interessata dall'applicazione della sua normativa.
- L'**Allegato B** - "Ambiti Urbani Unitari" - individua le principali vie storiche e piazze, anche con presenza di attività commerciali, suscettibili di maggior tutela e per cui siano da privilegiare interventi che affrontino in modo coordinato la progettazione e la sistemazione degli elementi di arredo urbano.
- L'**Allegato C** – "Abaco dell'Arredo Urbano" – è una guida agli interventi. Tale documento raccoglie le schede tecniche di alcuni degli elementi che compongono l'arredo urbano. In esso sono descritte le varie tipologie di elementi costituenti l'arredo urbano, e sono riportate indicazioni in merito alle tipologie d'intervento previste per gli stessi. Contiene, inoltre, una specifica sezione dedicata alle tavole cromatiche, in cui sono riportati alcuni campioni di colore da utilizzare come riferimento per la colorazione degli elementi che costituiscono l'arredo urbano.
- L'**Allegato D** – "Zone Titolo VI" – individua le zone del centro storico in cui è possibile accedere ai sostegni messi a disposizione dall'Amministrazione comunale per mettere a norma le attrezzature e gli arredi delle attività commerciali prima dei termini stabiliti dal presente regolamento.
- L'**Allegato E**, ultimo, ma non per importanza, è il "Modulo di Richiesta sostegno economico" che individua la procedura per richiedere un sostegno economico secondo quanto stabilito nel titolo VI.

Il Comune di Polizzi Generosa, con il suo straordinario patrimonio architettonico, rappresenta una testimonianza tangibile della storia e della cultura locale, un pilastro fondamentale dell'identità territoriale. Questo patrimonio, frutto di secoli di stratificazioni culturali, richiede interventi strategici per preservarne l'integrità, valorizzarne le unicità e renderlo fruibile alle future generazioni.

In questa prospettiva, le linee guida per la conservazione e il recupero del patrimonio non si limitano a principi generici, ma definiscono un percorso operativo che integra un'accurata analisi dello stato dell'arte, la catalogazione sistematica delle risorse architettoniche presenti e l'individuazione delle criticità che ne compromettono il decoro o la funzionalità.

Ogni elemento non congruo, individuato sia nel centro storico sia nel contesto paesaggistico, deve essere oggetto di proposte risolutive, che comprendano interventi mirati alla sua modifica, sostituzione o reintegrazione, sempre nel rispetto dei principi di coerenza storica e compatibilità estetica.

È prioritario promuovere l'uso di materiali e tecniche tradizionali, valorizzandone il ruolo sia in termini di autenticità che di sostenibilità, ma senza trascurare l'innovazione. In questo senso, le linee guida delineano una visione propositiva che non si limita alla conservazione del passato, ma lo pone in dialogo con le esigenze contemporanee.

Interventi mirati al miglioramento dell'efficienza energetica, all'adeguamento funzionale degli spazi e all'incremento dell'accessibilità rappresentano un'opportunità per integrare tradizione e modernità in modo armonioso, senza compromettere l'identità storica del territorio.

La definizione di categorie di intervento, basate sulle specificità delle diverse tipologie edilizie e sulle caratteristiche del tessuto urbano, rappresenta un elemento centrale del documento. Le linee guida sono arricchite da esempi virtuosi provenienti da contesti urbani simili, utili a orientare la progettazione verso soluzioni efficaci e rispettose.

Questi principi sono estesi anche al patrimonio rurale del territorio comunale, comprendendo beni come masserie, rifugi montani e altre architetture tradizionali, che contribuiscono a definire il paesaggio locale e a rafforzarne il valore identitario.

Inoltre, l'approccio propositivo delle linee guida sottolinea il ruolo del patrimonio architettonico come leva per il rafforzamento dell'identità culturale e lo sviluppo socio-economico della comunità.

Ogni intervento deve essere concepito non solo come un atto di tutela, ma come un'opportunità per riattivare dinamiche di crescita sostenibile, stimolando la partecipazione della comunità locale e il coinvolgimento di competenze professionali qualificate.

Garantire la continuità della memoria collettiva è un obiettivo imprescindibile. Le linee guida, pertanto, propongono soluzioni che assicurino una fruizione equa e diffusa del patrimonio, rendendolo accessibile e vivo per l'intera comunità, con particolare attenzione alle esigenze delle nuove generazioni. Questo approccio, fondato su una visione integrata e sistemica, mira a preservare il valore inestimabile di Polizzi Generosa, trasformando ogni intervento in un'occasione per rinsaldare il legame tra passato, presente e futuro.

L'elaborazione delle linee guida si basa su un approccio che prende come riferimento l'apparato normativo vigente, analizzandolo e declinandolo caso per caso per valutarne l'adeguatezza rispetto alle specificità del contesto locale. In questo processo, l'obiettivo è individuare, laddove necessario, soluzioni alternative o integrative che risultino idonee a garantire coerenza estetica, funzionalità e sostenibilità degli interventi.

Quando non sia possibile definire una soluzione definitiva, le linee guida propongono comunque azioni concrete volte a orientare il processo decisionale, fornendo indicazioni utili per raggiungere un equilibrio tra il rispetto delle norme e le peculiarità di Polizzi Generosa.

Vicolo Di Chiara; ©Luisa Lombardo, 2023

Centro Storico - Prospetti

Tra i vicoli; ©Carmelo Di Salvo, 2022

B.3. - DPR 31/2017
Prospetti

Interventi sui prospetti, diversi da quelli di cui alla voce B.2, comportanti alterazione dell'aspetto esteriore degli edifici mediante modifica delle caratteristiche architettoniche, morfo tipologiche, dei materiali o delle finiture esistenti, quali:

-modifica delle facciate mediante realizzazione o riconfigurazione di aperture esterne, ivi comprese vetrine e dispositivi di protezione delle attività economiche, o di manufatti quali cornicioni, ringhiere, parapetti;

-interventi sulle finiture esterne, con rifacimento di intonaci, tinteggiature o rivestimenti esterni, modificativi di quelli preesistenti;

-realizzazione, modifica o chiusura di balconi o terrazze; realizzazione o modifica sostanziale di scale esterne.

Art. 92 - Reg. Ed.
Aspetto e manutenzione degli edifici

Tutte le pareti esterne prospettanti su spazi pubblici e/o privati, anche se interni alla costruzione, e tutte le opere ad esse attinenti (finestre, parapetti, ecc...) devono essere realizzate con materiali e cura di dettagli tali da garantire la buona conservazione delle stesse nel tempo.

Nelle pareti esterne è vietato sistemare tubi di scarico di servizi igienici e degli acquai delle cucine e relative canne di ventilazione, o canalizzazione in genere.

Le tubazioni dell'acqua e del gas e i cavi telefonici ed elettrici non devono essere posti sulle pareti esterne se non in appositi incassi, e opportunamente rivestiti, in modo tale da consentire una idonea soluzione architettonica.

Per i prospetti, è fondamentale progettare, recuperare e mantenere gli edifici rispettando l'estetica e il decoro dell'ambiente urbano. I prospetti devono preservare l'aspetto originale dell'edificio e integrarsi nel contesto storico, evitando elementi che ne alterino le caratteristiche.

RACCOMANDAZIONI: Non è consentita l'installazione di sistemi fotovoltaici, griglie di aerazione visibili o verande. Particolare attenzione deve essere prestata agli edifici situati nel centro storico, che, essendo in gran parte "a schiera doppia," si affacciano sulle vie principali.

Sistemi di smaltimento delle acque piovane: Blocco lapideo forato per convogliare l'acqua in strada

Superfetazione aggiunta: Chiusura di balcone a veranda; da demolire

Implementazione tecnologica: Condotto di aereazione a vista; da rimuovere o nascondere

Art. 16.1 - RAU
Apparecchi di condizionamento dell'aria

È vietata l'installazione di apparecchi di condizionamento d'aria, di caldaie, serbatoi, motori, o altri macchinari e apparecchiature tecniche simili, sulle facciate, nei balconi, sulle coperture, e in genere lungo le strutture perimetrali degli edifici prospicienti spazi pubblici o pubbliche vie. È altresì vietata l'installazione dei suddetti apparecchi all'interno di cortili o ambienti connotati da elementi architettonici e decorativi qualificanti o di particolare pregio.

Art. 16.2 - RAU
Apparecchi di condizionamento dell'aria

Tali attrezzature, compatibilmente con le norme di sicurezza e le esigenze funzionali, potranno essere posizionate nei cortili privi di elementi decorativi e architettonici di pregio, in vani seminterrati o interrati provvisti di bocche di lupo, nei sottotetti, e, opportunamente mimetizzate, su terrazzi e balconi, purché l'impianto non risultivisibile da spazi pubblici o da pubbliche vie.

Art. 16.3 - RAU
Apparecchi di condizionamento dell'aria

È ammesso altresì il posizionamento dei macchinari per condizionatori, in nicchie già esistenti prive di valore storico- architettonico, chiuse con sportelli a griglia in ferro con maglie di larghezza massima 1cmx1cm, color grigio canna di fucile o dello stesso colore della parete, prevedendo gli opportuni accorgimenti per la raccolta delle acque di condensa al fine di evitare fenomeni di dilavamento delle pareti.

Art. 16.4 - RAU
Apparecchi di condizionamento dell'aria

È ammesso il posizionamento delle bocchette dei condizionatori all'interno dei telai delle finestre. Tutte le apparecchiature tecnologiche suddette e di qualunque altro tipo, poste in facciata o sui balconi dei prospetti prospicienti le pubbliche vie

Implementazione tecnologica: Griglia di aereazione perfettamente camuffata nel prospetto

Implementazione tecnologica: Caldaia in prospetto, da rimuovere

Implementazione tecnologica: Griglia di aereazione in ferro

Implementazione tecnologica: Unità esterna in prospetto, da rimuovere

Art. 12.1 - RAU
Cavi elettrici e telefonici e armadietti tecnologici

Nel caso di interventi che interessino la ristrutturazione, manutenzione straordinaria e il restauro complessivo di facciate di edifici pubblici o privati, è obbligatorio riordinare in modo organico i cavi della rete elettrica e telefonica, in mododa rendere pienamente leggibile l'impianto architettonico e, nel contempo, occultare il più possibile alla vista la presenza dei cavi e degli altri elementi tecnologici suddetti.

Art. 12.2 - RAU
Cavi elettrici e telefonici e armadietti tecnologici

I cavi dovranno essere alloggiati in apposite canalizzazioni interrate, in scanalature interne alle murature, o in condotti sottotraccia.

Art. 12.3 - RAU
Cavi elettrici e telefonici e armadietti tecnologici

Sulle facciate degli edifici le calate verticali dovranno essere alloggiate in appositi discendenti posizionati in corrispondenza dei limiti delle unità edilizie; i passaggi orizzontali vanno posti sotto il manto di copertura, immediatamente sopra le gronde, nell'inserzione tra parete verticale e gronda; oppure, i cavi possono passare (sempre utilizzando appositi condotti di alloggiamento), al di sopra delle fasce marcapiano, delle cornici o delle fasce marca davanzale, il più possibile arretrati per essere occultati alla vista.

Art. 12.6 - RAU
Cavi elettrici e telefonici e armadietti tecnologici

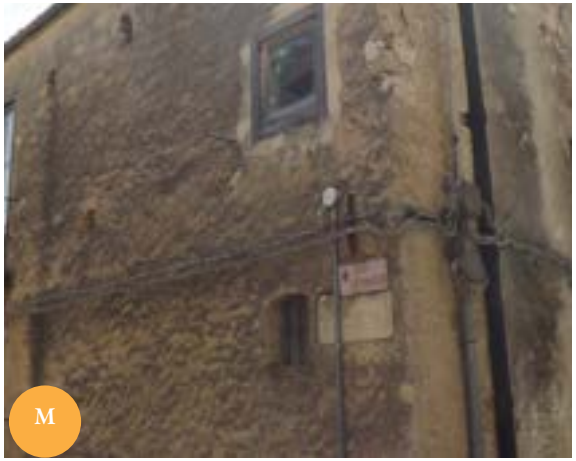
Gli elementi tecnologici di cui al punto precedente, se installati in appoggio alle facciate degli edifici, dovranno essere posizionati riducendo al minimo l'impatto visivo e rispettando gli elementi architettonici di pregio delle facciate stesse. Dovranno quindi essere accorpati e ordinati razionalmente, impiegando il minimo della superficie possibile.

Art. 12.7 - RAU
Cavi elettrici e telefonici e armadietti tecnologici

In linea di massima, gli armadietti e le scatole di derivazione, se a vista, dovranno essere color grigio canna di fucile, oppure se applicati sulla superficie delle facciate avere colorazioni o materiali che si mimetizzino con le stesse.

Implementazione tecnologica: Quadro elettrico esterno, da rimuovere o camuffare

Implementazione tecnologica: Faretto in prospetto, da rimuovere



Implementazione tecnologica: Cavi elettrici in facciata a grande impatto visivo, da camuffare

Implementazione tecnologica: Pannello solare in prospetto, da rimuovere

Porzioni di attacco a terra e basamentali

Art. 82 - Reg. Ed.
Zoccolature

Le parti basamentali delle facciate delle costruzioni devono presentare caratteristica di resistenza all'usura e all'uminidtà.

Particolari esigenze tecniche, architettoniche o ambientali possono consigliare in proposito circostanziare richieste da parte della Commissione Urbanistico-Edilizia, circa speciali rivestimenti di zoccolature.

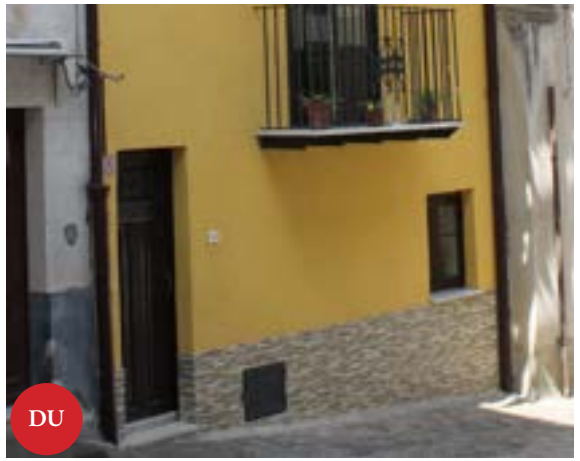
Si raccomanda che gli edifici siano dotati di sistemi protettivi, preferibilmente realizzata con lapidei locali, al fine di isolare l'edificio dall'umidità di risalita, proteggerlo dall'usura e garantirne l'integrazione armoniosa con il manufatto architettonico, in particolare nel prospetto.

RACCOMANDAZIONI: Risulta preferibile usare i colori corrispondenti alle tonalità in armonia con quelle del prospetto. Qualsiasi alterazione rispetto a quanto indicato è da considerarsi non idonea. Si consiglia la consultazione delle Cartelle RAL riportate a fine capitolo per la selezione cromatica.

Sistemi protettivi: Basamento in materiale locale, compatibile e da mantenere

Sistemi protettivi: Basamento con pietra non conforme alle peculiarità locali, da sostituire

Sistemi protettivi: Basamento con pietra non conforme alle peculiarità locali, da sostituire



Sistemi protettivi: Basamento con pietra non conforme alle peculiarità locali, da sostituire

Balconi

Elementi a sbalzo: Balcone conforme ai criteri di recupero e valorizzazione del patrimonio costruito;

I balconi, conformi alla tradizione architettonica, sono costituiti da mensole lapidee o metalliche con una una ringhiera metallica costituita da montanti verticali e decorazioni semplici. L'impiego della mensola lapidea si conferma idoneo per edifici storici e monumentali.

RACCOMANDAZIONI: L'uso di materiali moderni come il laterocemento è incompatibile con le caratteristiche storiche dei balconi e deve essere evitato, preferendo soluzioni che rispettino il contesto architettonico originario.

Elementi a sbalzo: Balcone conforme ai criteri di recupero e valorizzazione del patrimonio costruito;

Elementi a sbalzo: Balcone con struttura in cemento armato; da demolire e sostituire con una tecnologia locale

Elementi a sbalzo: Balcone con struttura in cemento armato e ringhiera con geometria complessa; da modificare

Elementi a sbalzo: Ringhiera con geometria complessa; da modificare

Intonaci

Art. 93 - Reg. Ed.
Tinteggiature e rivestimenti

In tutte le opere di ristrutturazione, risanamento, manutenzione ordinaria e straordinaria delle costruzioni, prima di dare luogo all'esecuzione di tinteggiature, intonaci colorari o rivestimenti esterni, gli interessati devono eseguire campioni su questo, onde consentire alle Autorità di controllo la ver5ifica della rispondenza di tali elementi alle indicazioni contenute nella concessione e/o autorizzazione, e lasciare il campione approvato sino all'ultimazione delle tinteggiature o del rivestimento.

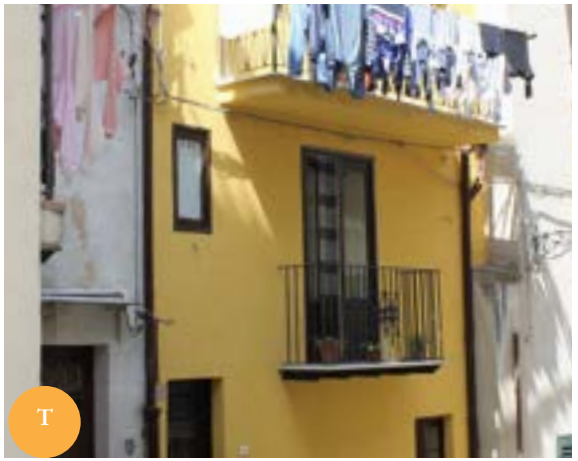
Il colore dei prospetti deve rispettare le tonalità della calcarenite proveniente dalle cave locali più vicine, assicurando coerenza cromatica con il contesto storico. Non è accettabile l'uso del giallo paglierino.

RACCOMANDAZIONI: Si consiglia di presentare in anticipo le prove colore e sottoporre la proposta cromatica alla valutazione della Soprintendenza, per garantire l'aderenza ai colori tipici dell'area, prima di depositare il progetto presso gli Uffici Tecnici del Comune. Si consiglia di fare riferimento alla Cartella RAL indicata a fine capitolo.

Rivestimenti protettivi: Tinteggiatura con colori in sintonia con la cromia della pietra delle cave locali

Rivestimenti protettivi: Tinteggiatura con colori in sintonia con la cromia della pietra delle cave locali

Rivestimenti protettivi: Tinteggiatura eseguita con colori incompatibili con la cromia della pietra delle cave locali



Rivestimenti protettivi: Tinteggiatura eseguita con colori incompatibili con la cromia della pietra delle cave locali

Infissi esterni verticali: Porta in legno, consona ai criteri di decoro urbano

Porte e portoni in legno di fattura tradizionale sono elementi essenziali per l'identità del Centro Storico e devono essere salvaguardati. La loro rimozione è vietata. Ogni intervento, anche se riguarda porzioni ridotte, deve essere valutato con estrema attenzione e cautela per preservare il valore storico e architettonico.

RACCOMANDAZIONI: Se in buono stato, è necessario limitarsi alla manutenzione ordinaria. In caso di degrado avanzato, è obbligatorio procedere con interventi di recupero. La colorazione di porte e portoni deve essere uniforme e coerente con quella degli infissi esterni, come finestre e porte-finestre, per garantire un aspetto armonico.

Infissi esterni verticali: Porta in legno, consona ai criteri di decoro urbano

Infissi esterni verticali: Porta in alluminio dorato; da sostituire

Infissi esterni verticali: Porta in alluminio dorato; da sostituire

Infissi esterni verticali: Porta e portone in alluminio dorato e con grata esterna; da sostituire

Infissi esterni verticali: Porta finestra conforme ai criteri di decoro architettonico e urbano

Gli infissi devono mantenere forma, dimensioni e colore coerenti con l'originaria linea costruttiva.

A Polizzi Generosa, gli infissi tradizionali sono realizzati in legno, di forma rettangolare allungata, semplici, e di colore verde o marrone, generalmente dotati di scuri o persiane per schermare la luce durante le ore più calde.

RACCOMANDAZIONI: Sono ammessi esclusivamente colori verde e marrone, con una preferenza per quest'ultimo, più diffuso e consigliato. L'uso di materiali diversi dal legno è tollerato solo se imitano l'aspetto originale, come finiture effetto legno con tonalità vicine al marrone.

Infissi esterni verticali: Porta finestra conforme ai criteri di decoro architettonico e urbano

Infissi esterni verticali: Porta finestra in alluminio; da sostiuire

Infissi esterni verticali: Porta finestra in alluminio; da sostiuire

Infissi esterni verticali: Infisso con colori incompatibili con la cromia degli infissi esterni locali; da tinteggiare

Art.35.1 - RAU
Serramenti

È vietato l'uso di serrande, cancelli esterni scorrevoli o ripiegati sulle parti murarie fiancheggianti le aperture degli esercizi commerciali. Possono derogare da tale normagli esercizi destinati alla trattazione di valori/oggetti preziosi, armi, e le farmacie. È tassativamente vietato l'uso di saracinesche e serrande a superficie continua a servizio delle vetrine degli esercizi commerciali.

Art.35.2 - RAU
Serramenti

Laddove consentito, nel caso di adozione di serrande avvolgibili, esse devono essere a maglia aperta, rettangolare, e a scorrimento verticale, e dovranno avere forme semplici e colore grigio come indicato nelle relative schede dell'Allegato C. In casi particolari di vetrine di impianto storico che siano conformi alle norme del presente Regolamento, laddove esistano saracinesche con colore abbinato agli infissi delle vetrine stesse, è possibile mantenere il colore originale. In nessun caso il cassonetto dell'avvolgibile dovrà essere visibile dall'esterno, o esserein aggetto rispetto al prospetto dell'edificio.

Art.35.3 - RAU
Serramenti

Serrande e saracinesche esistenti, che non siano a maglia aperta, ovvero che non rispettino le prescrizioni di cui ai commi precedenti, devono essere adeguate nei tempi e modi di cui all'Art. 54. Le saracinesche a chiusura continua esistenti dovranno essere sottoposte a manutenzione ordinaria e adottare il colore grigio palombino

Art.35.4 - RAU
Serramenti

Laddove consentiti, o non espressamente vietati, i serramenti e i relativi infissi dovranno essere applicati all'interno dei vani, senza modificare la sagoma né lo spessore originale di stipiti, soglie, architravi e cornici. La posizione della serranda avvolgibile, indipendentemente dalla posizione dell'infisso, sarà sempre sul filo interno della mazzetta della muratura.

Art.35.5 - RAU
Serramenti

I cancelli e le inferiate di recinzione per cortili, corti, giardini e simili devono essere realizzati in metallo e avere i colori indicati come da tabella.

Portoni

Infissi esterni verticali: Portone conforme ai criteri di decoro architettonico e urbano

Infissi esterni verticali: Portone conforme ai criteri di decoro architettonico e urbano

Infissi esterni verticali: Portone in ferro; da sostiuire

Infissi esterni verticali: Portone conforme ai criteri di decoro architettonico e urbano

Sistemi di smaltimento acque meteoriche, gronde e pluviali

Art. 14.1 - RAU
Condutture acqua, scarichi fognari, gronde, pluviali

Le condutture dell'acqua non possono essere posizionate in facciata.

Art. 14.2 - RAU
Condutture acqua, scarichi fognari, gronde, pluviali

Il contatore deve essere alloggiato in apposita nicchia opportunamente occultata come previsto nell'articolo precedente.

Art. 14.3 - RAU
Condutture acqua, scarichi fognari, gronde, pluviali

Su una stessa facciata, le nicchie di alloggiamento dei vari contatori (gas, acqua, telecom, ecc) devono essere allineate tra loro.

Art. 14.4 - RAU
Condutture acqua, scarichi fognari, gronde, pluviali

In generale le condutture degli scarichi fognari devono essere occultate alla vista;

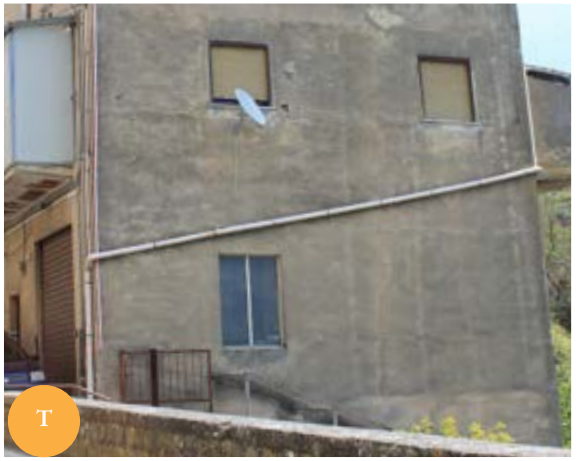
Art. 14.5 - RAU
Condutture acqua, scarichi fognari, gronde, pluviali

Gronde, canali, scossaline e discendenti installati in facciata devono essere in rame. I discendenti devono inoltre avere terminali in ghisa per un'altezza di min 1,5 mtda terra. I canali di gronda devono essere mantenuti in condizioni di pulizia e decoro, eripuliti periodicamente.

Sistemi di smaltimento delle acque piovane: Pluviali come da tradizione costruttiva locale

Sistemi di smaltimento delle acque piovane: Pluviali a vista; da integrare nella muratura o da tinteggiare

Sistemi di smaltimento delle acque piovane: Pluviali a vista; da integrare nella muratura o da tinteggiare



Sistemi di smaltimento delle acque piovane: Pluviali a vista; da integrare nella muratura o da tinteggiare

Cassette della posta

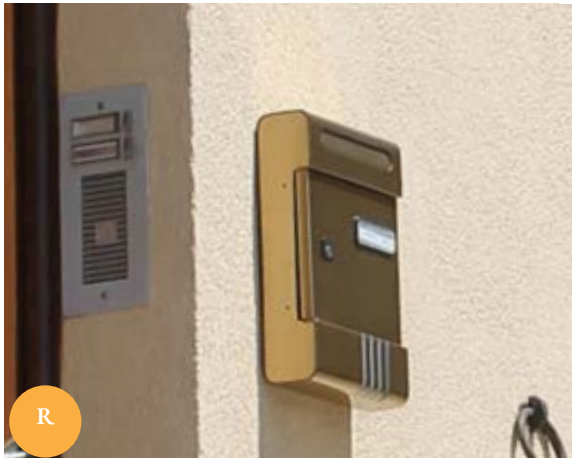
Elementi accessori: Cassetta postale in acciaio conforme ai criteri di decoro urbano

Le cassette della posta, parte integrante del prospetto, devono garantire un aspetto uniforme agli edifici, privilegiando materiali come ghisa o acciaio, nei colori consigliati dal RAU o della Cartella RAL, in linea con gli altri elementi di arredo urbano presenti nelle piazze.

RACCOMANDAZIONI: Una variante meno invasiva e maggiormente apprezzata dalla Soprintendenza, poiché meno invasiva, è l'installazione di cassette della posta incassate nella muratura. Tale scelta riduce l'impatto visivo e contribuisce a mantenere il prospetto libero da elementi estranei, preservandone l'estetica e l'armonia.

Elementi accessori: Cassetta postale in acciaio conforme ai criteri di decoro urbano

Elementi accessori: Cassetta postale con colori non conformi ai criteri di decoro urbano, da sostituire.



Elementi accessori: Cassetta postale con colori non conformi ai criteri di decoro urbano, da sostituire.

Cassetta della posta a incasso e a scomparsa a Sagunto, Valencia, Spagna.

Implementazione tecnologica: Sportello per contatore d'acqua camuffato nel prospetto

Gli sportelli esterni per acqua e gas costituiscono parte integrante del decoro urbano e devono essere trattati con la stessa cura riservata agli elementi più evidenti del prospetto. È imprescindibile che siano integrati nel paramento murario in modo tale da risultare quasi invisibili, evitando qualsiasi alterazione estetica dell'edificio.

RACCOMANDAZIONI: Gli sportelli devono essere incassati nella muratura e camuffati attraverso l'applicazione di intonaco o rivestimenti in colori identici o molto simili a quelli del prospetto. Questa soluzione garantisce la continuità visiva e preserva l'armonia del contesto storico-architettonico.

Implementazione tecnologica: Sportello per contatore d'acqua a vista; da sostituire

Implementazione tecnologica: Sportello per contatore d'acqua a vista; da tinteggiare

Implementazione tecnologica: Sportello per contatore d'acqua a vista; da tinteggiare

Sportello per contatore d'acqua a Solunto (Valencia), perfettamente camuffato nel prospetto

Verande e pensiline

Art. 83 - Reg. Ed.
Elementi aggettanti

Nessun aggetto maggiore di 10 cm può essere ammesso al di sotto della quota di m 3.50 relativamente a qualsiasi prospetto sul pubblico passaggio. Tale divieto vale anche nel caso di oggetti di tipo mobile o provvisorio quali ad esempio porte, gelosie e persiane.

Nel caso in cui la strada sia fornita di marciapiedi tali aggetti non possono essere previsti ad un'altezza inferiore a m 2.50.

Se per ragioni di sicurezza sono necessari infissi con aperture verso l'esterno ad una quota inferiore, questi devono essere opportunamente arretrati.

Balconi in aggetto e pensiline non sono consentiti su strade pubbliche o private di larghezza totale (comprensiva degli eventuali marciapiedi) inferiore ai m 8.00, se edificate su entrambi i lati, e ai m 6.00, se la fabbricazione è consentita su un solo lato.

La realizzazione edi tali aggetti è consentita solo a quote pari o superiori a m 3.50 dal piano del marciapiede rialzato; in assenza di marciapiede, ovvero, nel caso di marciapiede non rialzato, l'altezza minima deve essere portata a m 4.50.

Gli aggetti non deono sporgere, sul suolo pubblico o d'uso pubblico, oltre i m 1.20 e devono, comunque, essere arretrati di cm 50 dal filo esterno del marciapiede rialzato.

I balconi totalmente chiusi (bow-window), o con più di due lati chiusi sono ammessi soltanto su spazi pubblici di larghezza superiore a m 12 o nelle costruzioni arretrate dal filo stradale. Sono sottoposti alle stesse limitazioni prevista per i balconi aperti.

Gli elementi aggettanti non sono consentiti nella porzione dell'edificio corrispondente al piano terra del fronte architettonico. L'edilizia di base nel centro storico si presenta a filo, priva di elementi quali tettoie e pensiline, in coerenza con la tipologia costruttiva tradizionale.

RACCOMANDAZIONI: A causa della conformazione dei vicoli, spesso così stretti da consentire appena il passaggio di un'autovettura, ogni elemento aggettante posizionato all'altezza del primo piano e al di sotto dei 3,50 m deve essere rimosso. Inoltre, non è consentita l'installazione di nuovi elementi di questo tipo.

Strutture di protezione: Pensilina in acciaio e vetro; da sostituire

Strutture di protezione: Pensilina non conforme alla normativa; da rimuovere

Strutture di protezione: Pensilina non conforme alla normativa; da rimuovere

Centro Storico - Ultime elevazioni fuori terra

Polizzi Generosa from above; ©Carmelo Di Salvo, 2022

Coperture

B.4. - DPR 31/2017
Coperture

Interventi sulle coperture, diversi da quelli di cui alla voce B.2, comportanti alterazione dell'aspetto esteriore degli edifici mediante modifica delle caratteristiche architettoniche, morfotipologiche, dei materiali o delle finiture esistenti, quali:

-rifacimento del manto del tetto con materiali diversi; modifiche alle coperture finalizzate all'installazione di impianti tecnologici;

-modifiche alla inclinazione o alla configurazione delle falde;

-realizzazione di lastrici solari o terrazze a tasca;

-inserimento di canne fumarie o comignoli;

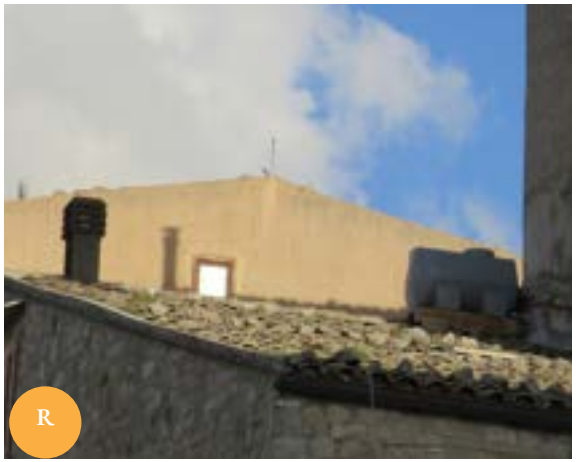
- realizzazione di finestre a tetto, lucernari, abbaini o elementi consimili.

Art. 85 - Reg. Ed.
Coperture

Le coperture, i loro aggetti e i volumi tecnici sporgenti da esse devono considerarsi elemento architettonico o di conclusione dell'edificio e, pertanto, la loro realizzazione deve rispondere a precise prescrizioni di progetto mediante il coordinamento dei diversi elementi e materiali relativi ai prospetti e alle coperture stesse.

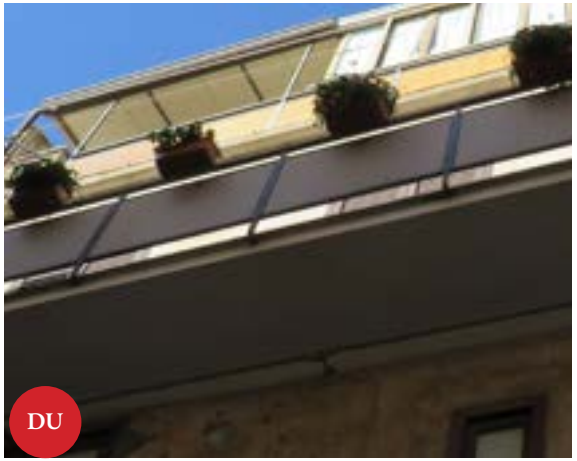
La copertura dell'edificio riveste un ruolo fondamentale nell'immagine del borgo, oltre alla sua funzione protettiva contro gli agenti atmosferici, la copertura costituisce una parte integrante del paesaggio, pertanto deve essere trattata con la stessa attenzione riservata alla facciata dell'edificio. La copertura deve essere caratterizzata da uniformità in termini di materiali e forme. Deve essere semplice, con una o due falde, ricoperta da coppi siciliani appoggiati, fissati stabilmente da pietre locali.

RACCOMANDAZIONI: È fortemente raccomandato non aggiungere alcun elemento sulla copertura, lasciandola priva di modifiche che potrebbero alterarne l'aspetto originario.



Implementazione tecnologica: Serbatoio d'acqua e canna fumaria di color nero; da rimuovere

Implementazione tecnologica: Serbatoio d'acquain copertura; da rimuovere



Protezione lastrici solari: Tettoia piana e non in coppi; da demolire

Superfetazione aggiunta: Veranda non conforme alla normativa; da demolire

Chiusura orizzontale: Tetto a doppia falda con coppi siciliani e unica antenna centralizzata

Protezione lastrici solari: Pergolato in terrazza

Implementazione tecnologica: Pannelli solari, ad alto impatto paesaggistico; da rimuovere

Manto di copertura: Copertura non in coppi; da ricostruire

Protezione lastrici solari: Tettoia in lamierino, da sostituire con pergolato o da tettoia ricoperta in coppi siciliani

Ultime elevazioni fuori terra: inserimento di verande, tettoie e altri sistemi di chiusura di lastrici solari e balconi

Protezione lastrici solari: Tettoia non conforme alla tradizione costruttiva locale; da rimuovere

Le verande e le pensiline, indipendentemente dal materiale o dalla tipologia, non sono ammesse e devono essere rimosse. La loro presenza, oltre a compromettere il prospetto principale e alterare la volumetria dell'edificio, danneggia il paesaggio, creando un disturbo nella continuità costruttiva e nell'armonia del contesto urbano.

RACCOMANDAZIONI: Nelle terrazze piane è consentita esclusivamente l'installazione di pergolati in legno, come da tradizione locale. Qualora si necessiti di uno spazio esterno, com copertura a una o due falde, è permesso realizzare "*terrazze a tasca*" secondo la tradizione, per garantire continuità alle coperture e permettere un affaccio esterno.

Protezione lastrici solari: Tettoia non conforme alla tradizione costruttiva locale; da demolire

Protezione da ombreggiamento e Superfetazione aggiunta: Tecnologie errate; da rimuovere e/o da demolire

Superfetazione aggiunta: Non conforme alla tradizione costruttiva locale; da rimuovere e/o da demolire

Esempio di terrazza a tasca a Gangi, Madonie, Palermo

Art. 13.1 - RAU
Tubi del gas e canne fumarie

Le tubazioni del gas, di norma, non possono essere istallate a vista sulla facciata;le stesse, devono trovare alloggiamento nelle facciate interne, nascoste alla vista dalla pubblica via – fatto salvo il rispetto di tutte le norme di sicurezza vigenti in materia.

Art. 13.2 - RAU
Tubi del gas e canne fumarie

Qualora sia dimostrata l'impossibilità di operare nel modo descritto al precedente comma, le tubazioni potranno essere collocate sulle facciate laterali prospicienti vie di minor importanza, e solo in ultima ipotesi sulla facciata principale. In quest'ultimocaso, le tubazioni dovranno essere ordinatamente allineate in una delle estremità della facciata, dipinte del colore della stessa, o inserite in appositi alloggiamenti e discendentiin rame. L'organizzazione delle tubazioni e degli armadietti relative alla distribuzione del gas metano deve essere valutata anche dagli enti gestori per quanto di loro competenza.

Art. 13.3 - RAU
Tubi del gas e canne fumarie

Sulla facciata prospiciente la pubblica via è tollerata solo la tubazione principale, disposta in modo da essere quanto più possibile nascosta alla vista. La tubazione deve essere alloggiata in un'apposita scanalatura o canalizzazione realizzata con materiali adeguati alle preesistenze o comunque equivalenti, e opportunamente mimetizzati adottando anche colori simili ai paramenti di fondo sui quali si inseriscono.

Art. 13.4 - RAU
Tubi del gas e canne fumarie

L'installazione in facciata del contatore del gas, se possibile, deve trovare alloggiamento in un'apposita nicchia opportunamente occultata da una chiusura, a filo facciata, fatta con sportelli che si mimetizzino alla facciata stessa come prescritto al successivo comma. Contatori esterni (e relativi armadietti) che non possano essere incassati, devono essere di color grigio canna di fucile o mimetizzati con la facciata.

Art. 13.5 - RAU
Tubi del gas e canne fumarie

Nel caso di facciate intonacate si ammettono sportelli opportunamente trattati per accogliere un intonachino identico a quello di facciata. Nel caso di facciate in pietrao mattone faccia vista, si devono utilizzare sportelli con telaio in ferro di colore grigio canna da fucile. È vietato il passaggio di canne fumarie in facciata.

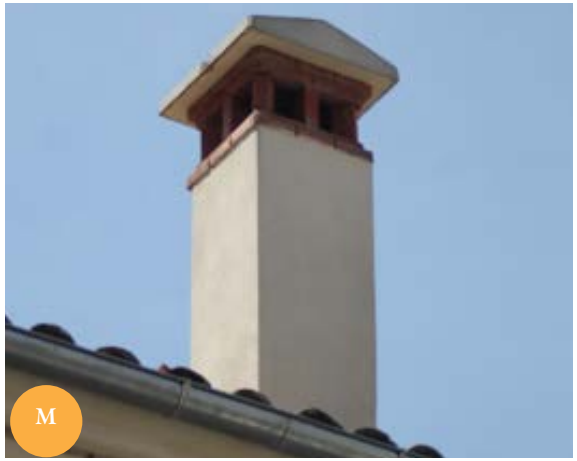
Canne fumarie

Le canne fumarie, parte integrante degli edifici,delle coperture e del paesaggio, richiedono particolare attenzione durante l'installazione. È fondamentale che siano invisibili e, pertanto, devono essere nascoste all'interno della copertura, coperte dai coppi.

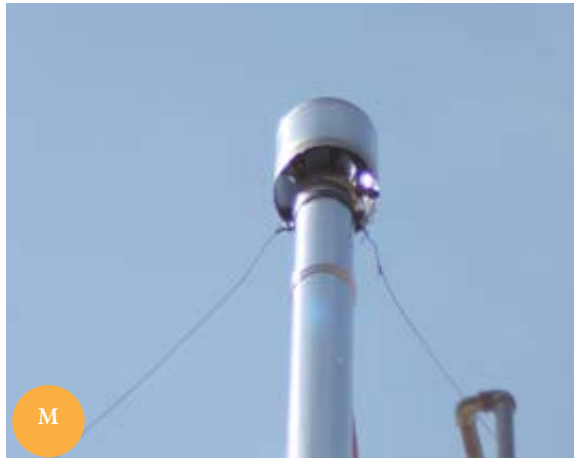
Un'eccezione riguarda le canne fumarie degli immobili commerciali, in particolare quelli con attività di gastronomia calda, per i quali è obbligatorio convogliare i fumi e i vapori sulla sommità dell'edificio. In questi casi, se la canna fumaria è in acciaio, il colore consigliato è il rame, in modo da mimetizzarsi con il colore dei coppi.

RACCOMANDAZIONI: Si consiglia di considerare l'uso di piastre elettriche, per le quali non sussiste l'obbligo di installare canne fumarie visibili..

Sistemi di smaltimento dei fumi: Canna fumaria conforme, ricoperta in coppi



Sistemi di smaltimento dei fumi: Mancanza di coppi in sommità, da modificare



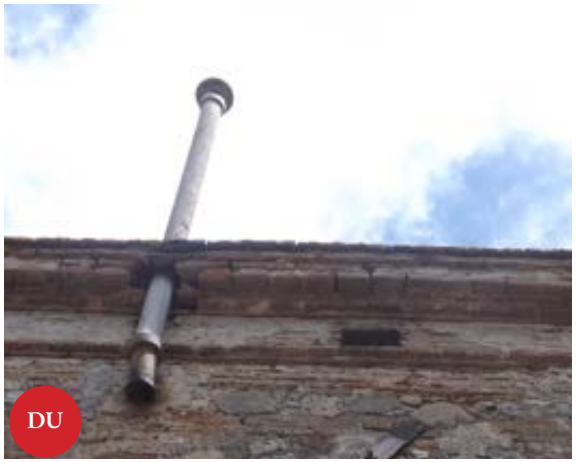
Implementazione tecnologica: Canna fumaria con colorazione non idonea; da modificare

Sistemi di smaltimento dei fumi: Canna fumaria conforme, ricoperta in coppi e camuffata

Sistemi di smaltimento dei fumi: Canna fumaria obsoleta; da rimuovere

Sistemi di smaltimento dei fumi: Canna fumaria obsoleta; da rimuovere

Sistemi di smaltimento dei fumi: Migliorare nelle fattezze e nella predisposizione di coppi in sommità, da sostituire



Sistemi di smaltimento dei fumi: Canna fumaria obsoleta; da rimuovere

Sistemi di smaltimento dei fumi:

Art. 94 - Reg. Ed.
Antenne radio-televisive

Nelle nuove costruzione, ristrutturazioni o nelle opere di manutenzione straordinaria di edifici, con più di una unità immobiliare o nei quali comunque possono essere installati più apparecchi radio o televisivi con necessità di intenna, è obbligatoria la posa in opera di un'unica antenna centralizzata.

Sono vientate le discese delle antenne mediante cavi voltanti; tali cavi, devono essere disposti nelle pareti interne. Nelle costruzioni e nel caso ciò non fosse possibile, in appositi incassi, e opportunamente rivestiti, in modo tale da consentire una idonea soluzione architettonica.

Art. 17.1 - RAU
Antenne e parabole

Le antenne e parabole televisive, in numero non superiore a una per ogni unità condominiale, devono essere collocate esclusivamente sulla copertura degli edifici a distanza dal filo di gronda non inferiore alla rispettiva altezza emergente dal tetto; sono da escludersi pertanto le installazioni su balconi o terrazzi non di copertura.

Art. 17.2 - RAU
Antenne e parabole

Per determinati ambiti urbani quando le dimensioni e la geometria della falda lo permettano, è comunque prescrittival'installazione delle parabole a una distanza dal filo di gronda pari a minimo il doppio della sua altezza. Possono essere ammesse, anzi sono consigliabili, collocazioni alternative (giardini o cortili, corpi edilizi ribassati, nicchie o chiostrine, ecc.) quando la conformazione dell'edificio renda tale collocazione di impatto minore rispetto a quella sulla copertura. Le parabole dovranno essere di colore tale da non arrecare contrasto con il colore delle coperture. Tutte le antenne dovranno essere prive di logotipi, fregi, scritte o altri elementi suscettibili di evidenziarne la presenza.

Art. 17.3 - RAU
Antenne e parabole

Nel caso di manutenzione ordinaria /straordinaria del tetto è obbligatoria lacentralizzazione delle antenne televisive esistenti.

Antenne radio-televisive e parabole

L'installazione di antenne sui balconi e sulle pareti dei condomini è un fenomeno sempre più diffuso, creando una problematica su diversi fronti. In particolare, tale proliferazione risulta problematica per almeno tre motivi principali:

- salvaguardia del decoro architettonico dell'edificio e dell'aspetto paesaggistico;
- conformità con i regolamenti comunali;
- le decisioni prese dalle assemblee condominiali riguardo gli assetti e le installazioni.

RACCOMANDAZIONI: È preferibile adottare soluzioni collettive per antenne e parabole, minimizzando così la presenza di antenne visibili.

Sistema per la captazione di radiofrequenze: Antenna televisiva collettiva, conforme alla normativa

Sistema per la captazione di radiofrequenze: Antenna televisiva collettiva, conforme alla normativa

Sistema per la captazione di radiofrequenze: Antenne televisive multiple, da unificare

Sistema per la captazione di radiofrequenze: Antenne televisive multiple, da unificare

Sistema per la captazione di radiofrequenze: Parabola obsoleta e a vista su strada, da rimuovere

Sistema per la captazione di radiofrequenze: Parabola obsoleta e a vista su strada, da rimuovere

Sistema per la captazione di radiofrequenze: Parabola obsoleta e a vista su strada, da rimuovere

Sistema per la captazione di radiofrequenze: Parabola obsoleta e a vista su strada, da rimuovere

Sistema per la captazione di radiofrequenze: Parabola obsoleta e a vista su strada, da rimuovere

Un salotto a cielo aperto a Polizzi Generosa; ©Luisa Lombardo, 2023

Fontanelle, panchine e cestini

Art. 95 - Reg. Ed.
Decoro e arredo urbano

Le costruzioni a carattere semipermanente o provvisorio, devono essere previsti e realizzati dal sindaco. Sono tassativamente vietate tutte quelle opere o iscrizioni che possono nuocere al decoro dell'ambiente, alterare elementi architettonici o limitare la visuale di sfondi architettonici, paesistici o il diritto di veduta dei vicini. Tutti gli elementi relativi all'arredo urbano e alle sistemazioni esterne (fermate di servizio per mezzi pubblici, cassette per l'inoltro della corrispondenza, panchina, accessi e percorsi pedonali relativi a zone verdi, spazi di sosta per la rcreazione, attrezzature per la raccolta rifiuti, fontanelle, ecc...) devono essere realizzati in modo da essere agibili e utilizzabili anche da persone anziane e/o con ridotte o impedite capacità motorie.

L'arredo urbano è essenziale per definire l'identità degli spazi pubblici, in particolare quelli comuni.

I tavoli e le sedie, destinati esclusivamente agli spazi autorizzati, devono essere realizzati con struttura portante in metallo, legno o ghisa. L'utilizzo di materiali alternativi è consentito solo previa autorizzazione dell'ufficio competente.

RACCOMANDAZIONI: Si raccomanda l'uso dei materiali indicati per preservare un'immagine decorosa e coerente con l'ambiente urbano.

Arredo urbano: Panchina conforme ai criteri di arredo urbano

Arredo urbano: Fontana non in funzione, da riattivare

Arredo urbano: Fontana non in funzione, da riattivare

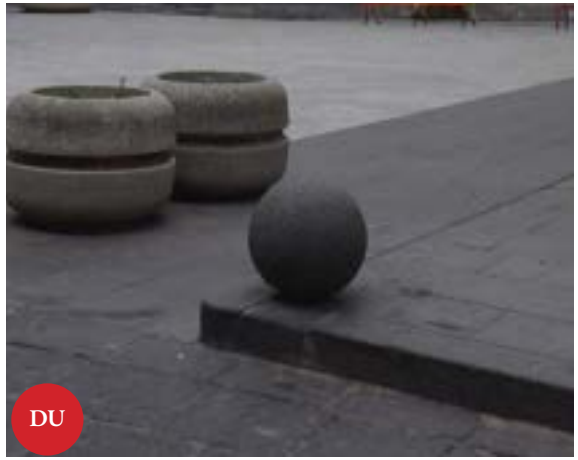
Arredo urbano: Panchina in cemento armato; da sostituire

Arredo urbano: Panchina obsoleta e con materiali non idone; da sostituire

Arredo urbano: Panchina obsoleta e con materiali non idone; da sostituire

Elementi per lo smaltimento dei rifiuti: Cestino per la raccolta dei rifiuti consona ai criteri di arredo urbano

Elementi per lo smaltimento dei rifiuti: Cestini obsoleti; da sostituire



Sistemi parapedonali: Elementi non idonei alle peculiarità materico costruttive del luogo

Sistemi per l'erogazione dell'acqua comunale e parapedonali: Elementi conformi alla normativa

Fioriere

Elementi di decoro: Fioriere in marmo, non consono ai criteri di decoro urbano

Le fioriere devono essere realizzate con materiali e tipologie che si integrano armoniosamente con gli altri elementi dell'arredo urbano e con l'ambiente circostante. Nel centro storico, le fioriere e i vasi sono ammessi esclusivamente in cotto, ferro o ghisa decorata.

RACCOMANDAZIONI: Le fioriere utilizzate per delimitare gli spazi concessi devono essere uniformi tra loro. Si raccomanda di scegliere essenze arbustive sempreverdi e autoctone per favorire la compatibilità con il paesaggio locale.

Elementi di decoro: Fioriere in cotto, consone ai criteri di decoro urbano

Elementi di decoro: Fioriere in legno, da sostituire

Elementi di decoro: Fioriere in plastica e color lilla, da sostituire

Elementi di decoro: Fioriere in pietra, da sostituire

Art. 96 - Reg. Ed.
Mostre, vetrine e insegne in genere

...fare domanda presentando un disegno da un tecnico abilitato dell'opera da realizzare con i dettagli, materiali e colori da impiegare, nonchè di ogni particolare costruttivo. Deve, inoltre, essere dimostrato, attraverso schizzi prospettici e/o fotomontaggi, l'inserimento dell'opera nell'ambiente architettonico e paesistico. Il progetto deve individuare anche appositi spazi per la collocazione di mostre, insegne, targhe e simili in maniera organizzata e unitaria. Tali mostre, vetrine e simili non devono in alcun modo alterare, modificare o coprire gli elementi architettonici delle costruzioni sulle quali vengono installate. L'installazione deve essere fatta, in ogni caso, in modo da permettere la massima facilità di pulizia e manutenzione. Non devono aggettare del filo esterno dell'edificio più di 10 cm. È consentito apporre insegne a bandiera di sporgenza massima pari alla larghezza del marciapiede diminuita di cm 50 e comunque non superiore a m 1.20 e ad un'altezza non inferiore a m 2.50 dal marciapiede rialzato. Tale tipo di insegne è vietato in assenza di marciapiede.

Art. 25 - RAU
Insegne pubblicitarie di esercizi commerciali

L'inserimento di insegne ed indicazioni di carattere commerciale all'interno del centro storico concorre in maniera importante alla qualificazione o dequalificazione del contesto architettonico e ambientale esistente. Le insegne non devono pertanto alterare la percezione degli spazi urbani e degli elementi architettonici e di decoro degli edifici, e non possono essere installate in modo da coprire gli elementi decorativi degli edifici.

Art. 25.1 - RAU
Insegne pubblicitarie di esercizi commerciali

Devono avere sagoma regolare ed essere collocate in modo da non ostacolare la visibilità di segnali stradali, né creare pericolo per la circolazione. Nel caso siano effettuati lavori manutentivi e/o di restauro delle facciate di edifici in cui siano inserite delle attività commerciali, è fatto perciò obbligo di procedere contestualmente, e a seconda dello stato dei luoghi, al riordino, all'adeguamento e all'eventuale sostituzione delle insegne ed indicazioni commerciali e pubblicitarie esistenti, armonizzando le soluzioni nel contesto di un progetto unitario delle facciate, salvaguardando al contempo le insegne di valore storico-artistico e documentario.

Art. 25.2 - RAU
Insegne pubblicitarie di esercizi commerciali

Per ambiti urbani unitari, rappresentati da slarghi o porzioni di vie, o comunque da parti urbanisticamente omogenee, si dovranno privilegiare interventi che affrontino, in modo coordinato ed unitario, la progettazione e la sistemazione anche degli elementi che hanno funzioni commerciali.

Insegne e segnaletica monumentale

Le insegne urbane di Polizzi Generosa, così come la toponomastica, devono rispettare la tradizione locale, utilizzando ceramica artistica locale dipinta a mano, con colori e motivi tipici della ceramica siciliana. Le forme e i colori antichi sono particolarmente adatti sia all'arredamento contemporaneo che all'architettura locale in pietra calcarenite.

RACCOMANDAZIONI: Le insegne non devono compromettere la percezione degli spazi urbani e degli elementi architettonici. È vietato installarle in modo da coprire i dettagli decorativi degli edifici, come fregi, cornici marcapiano o interferire con relative strutture architettoniche.

Sistemi di comunicazione visiva: Insegne consone ai criteri di arredo urbano.

DU

Sistemi di comunicazione visiva: Insegna non consone ai criteri di arredo urbano, non conforme alla normativa

DU

Sistemi di comunicazione visiva: Insegna non consone ai criteri di arredo urbano, non conforme alla normativa

DU

Sistemi di comunicazione visiva: Insegna non consone ai criteri di arredo urbano, non conforme alla normativa

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Sistemi di comunicazione visiva: Insegna non consone ai criteri di arredo urbano, non conforme alla normativa

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Sistemi di comunicazione visiva: Insegna non consone ai criteri di arredo urbano, non conforme alla normativa

DU

Sistemi di comunicazione visiva: Insegna non consone ai criteri di arredo urbano, non conforme alla normativa

Art. 23.1 - RAU
Segnaletica per indicazione attività professionali e segnaletica per i monumenti

Per contrassegnare la sede di uffici privati, studi professionali, aziende, associazioni e istituti, può essere collocata, lungo le facciate al piano terra degli edifici, una targa per ogni specifico soggetto. Le targhe vanno installate di fianco alle aperture nelle modalità di cui al successivo comma 23.2, e in caso di più unità, vanno raggruppate e organizzate razionalmente, senza occultare gli elementi decorativi che caratterizzano la facciata. Nei casi di dimostrata impossibilità all'installazione di fianco alle aperture, le targhe possono essere collocate sul portone d'ingresso, qualora lo stesso non rivesta interesse storico - artistico.

Art. 23.2 - RAU
Segnaletica per indicazione attività professionali e segnaletica per i monumenti

Nel caso di più targhe da installare su uno stesso edificio o di fianco ad unostesso vano, dovrà essere utilizzata una composizione con targhe aventi medesime caratteristiche per dimensioni forme e materiali, e dovranno essere installate allineate su un unico telaio portante.

Art. 23.5 - RAU
Segnaletica per indicazione attività professionali e segnaletica per i monumenti

Le targhe potranno essere in metallo, ottone o bronzo anticati, in pietra, in terracotta, in vetro/plexiglass trasparente.

Art. 23.6 - RAU
Segnaletica per indicazione attività professionali e segnaletica per i monumenti

I caratteri utilizzati per le iscrizioni, potranno essere incisi, stampati; oppureapplicati sulla superficie della targa. Anche per le scritte devono essere utilizzati materiali coerenti con quelli richiamati al comma precedente e colori adeguati al contesto.

Art. 23.7 - RAU
Segnaletica per indicazione attività professionali e segnaletica per i monumenti

Non possono essere installate targhe su elementi di valore storico artistico, o su elementi architettonici decorativi che contribuiscano a caratterizzare l'architettura delle facciate degli edifici.

Segnaletica monumentale: Cartello informativo in ceramica locale

Segnaletica monumentale: Cartello informativo obsoleto; da sostituire e digitalizzare

Segnaletica monumentale: Cartello informativo disposto sul fronte architettonico del monumento; da rimuovere

Segnaletica monumentale: Cartello direzionale obsoleto; da sostituire

Tende e sistemi di protezione dal sole e ombreggiatura

Art. 97 - Reg. Ed.
Tende aggettanti sullo spazio pubblico

Le tende aggettanti sono proibite nelle strade e piazze prive di marciapiede.

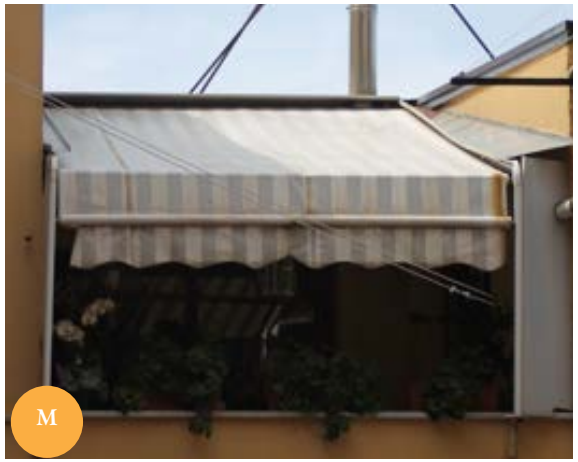
Nelle strade con marciapiede l'aggetto non può oltrepassare il limite di cm 50 dal ciglio del marciapiede verso l'interno.

Le tende, le loro appendici e i loro meccanismi non possono essere situati ad altezza inferiore a m 2.20 dal marciapiede. Sono vietate le appendici verticali, anche in tela o le frange, che scendano al disotto di m 2.20 dal marciapiede stesso.

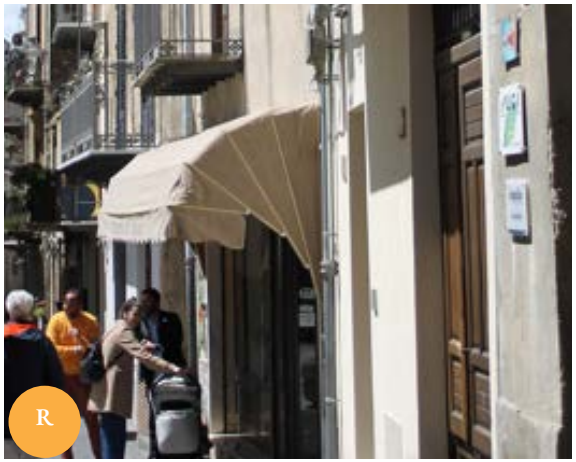
Le tende aggettanti su spazio pubblico devono essere di colore neutro per preservare l'integrità estetica dell'architettura. La struttura deve essere semplice e regolare, evitando forme bombate, mentre il tessuto non dovrà presentare righe o strisce. È preferibile optare per tonalità come il beige o il bianco sporco, che si armonizzano con il colore della pietra locale e si integrano con i prospetti degli edifici.

RACCOMANDAZIONI: Si consiglia di scegliere un colore neutro o una tonalità dalla Cartella RAL (Gialla) a fine capitolo. Qualsiasi altro colore sarà considerato non idoneo.

Sistemi per l'ombreggiamento: Tendaggio residenziale con colorazione non in sintonia con il prospetto



Sistemi per l'ombreggiamento: Tendaggio residenziale con colorazione non in sintonia con il prospetto



Sistemi per l'ombreggiamento: Tendaggio con colorazione adeguata, ma con struttura complessa, da sostituire

Tendaggio idoneo per ombreggiare durante le giornate particolarmente calde, Valencia, Spagna

Art. 15.1 - RAU
Impianti di pubblica illuminazione

Gli elementi della pubblica illuminazione devono adeguarsi alle apparecchiature storiche in ghisa e ferro esistenti, sia per la sostituzione che per la messa in opera di armature e sostegni. In ogni caso, per tali elementi dovrà essere utilizzato il colore grigio antracite/grafite/canna di fucile di cui all'All. C. In generale per la pubblica illuminazione, su palo, su mensola, o sospesa, il Comune dovrà adottare soluzioni volteal conseguimento di: uniformità, qualità estetica e sicurezza stradale, seguendo criteri diomogeneità tipologica, formale e materiale, nonché il rispetto delle norme vigenti in materia di inquinamento luminoso e risparmio energetico.

Art. 15.3 - RAU
Impianti di pubblica illuminazione

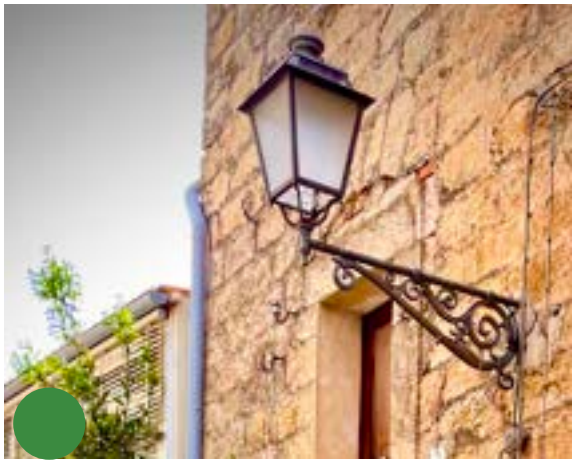
Gli impianti di videosorveglianza o altri apparecchi simili devono avere un colore integrato al supporto sul quale vengono istallati al fine di limitare al minimo l'impatto visivo.

Illuminazione pubblica

La corretta progettazione dell'illuminazione pubblica deve tener conto di vari fattori, tra cui la qualità e l'omogeneità della luce emessa, l'efficienza energetica e la durata dell'impianto, in relazione alle sue specificità. La scelta delle lampade e delle fonti luminose deve essere adeguata alle esigenze del contesto, considerando la presenza di monumenti o edifici storici nelle vicinanze.

RACCOMANDAZIONI: Per favorire l'eliminazione dei cavi aerei, l'illuminazione pubblica dovrebbe essere integrata negli edifici e nei prospetti, utilizzando materiali come ferro o acciaio, e preferibilmente impiegando lampade a LED.

Sistemi di illuminazione: Illuminazione pubblica a led consona ai criteri di decoro urbano



Sistemi di illuminazione: Illuminazione pubblica consona ai criteri di decoro urbano e con illuminazione led

Sistemi di illuminazione: Illuminazione pubblica non consona ai criteri di decoro urbano

Sistemi di illuminazione: Illuminazione pubblica non consona ai criteri di decoro urbano

Pavimentazione

Art. 31.1 - RAU
Tutela di pavimentazioni di strade e piazze, fontane pubbliche e monumenti, buche pontaie

Le pavimentazioni e le murature di tipo tradizionale del centro storico devono essere tutelate.
Per interventi sulle pavimentazioni tradizionali di strade e piazze del centro storico, siano esse in pietra o in mattoni, dovrà essere posta particolare cura nella scelta dei materiali, nella posa in opera degli elementi e nella ricostituzione delle fughe, riprendendo il disegno originale della trama.
Per la sistemazione di strade e piazze con pavimentazioni di tipo tradizionale in pietra èsempre preferibile utilizzare materiali lapidei tipici originari del luogo, e comunque, laddove si intervenga per ricostruzioni parziali si deve sempre utilizzare materiali ugualialla preesistenza. La sigillatura delle fughe per le suddette pavimentazioni va sempre fatta con sabbia semplice o con boiacca di sabbia e cemento, e comunque con malte cromaticamente adeguate alle colorazioni tradizionali. Nel caso di interventi parziali su pavimenti danneggiati o bisognosi di manutenzione, si dovranno sempre evitare sigillature con malte che producano effetti cromatici differenti rispetto alle sigillature preesistenti.

Art. 31.2 - RAU
Tutela di pavimentazioni di strade e piazze, fontane pubbliche e monumenti, buche pontaie

È vietato asfaltare le pavimentazioni tradizionali esistenti nel centro storico.

In passato, i tombini erano realizzati in pietra locale, materiale che garantiva grande durabilità, resistenza agli agenti atmosferici e una perfetta continuità con le pavimentazioni storiche. La modernità ha introdotto la sostituzione con tombini in ferro, ma per preservare il decoro urbano del borgo, è sempre preferibile ricorrere all'uso della pietra.

RACCOMANDAZIONI: Se l'uso del ferro è necessario, è importante che i tombini siano realizzati con disegni storici che richiamino le caratteristiche degli esemplari più antichi, in modo da evitare discontinuità visive con la pavimentazione.

Sistemi di smaltimento delle acque piovane: Tombino in pietra, consono ai criteri di decoro urbano

Sistemi di smaltimento delle acque piovane: Tombini in ferro, parzialmente compatibile ai criteri di decoro urbano

Sistemi di smaltimento delle acque piovane: Tombino in pietra deteriorato, da sostituire

Masseria Verbumcaudo; ©Luisa Lombardo, 2023

Tipologie architettoniche sparse nel territorio

Art. 106 - Reg. Ed.
Manutenzione delle abitazioni rurali

Analogamente a quanto prescritto per le costruzioni in genere le abitazioni rurali devono devono essere mantenute in modo conforme alle esigenze dell'abitabilità, dell'igiene e del decoro.

In linea con quanto già affrontato nelle sezioni precedenti, medesime considerazioni vanno fatte per le case rurali, masserie, ville, mulini , pagliai, marcati (ovili), cartiere, santuari e monasteri che detengono le stesse peculiarità riscontrate nell'edilizia di base del centro storico di Polizzi Generosa.

Un "pagghiaru" (in alto a sinistra), Mulino Bitta (in alto a destra), Masseria Verbumcaudo in basso a sinistra), Una casa (in basso al centro); Masseria Donalegge (in basso a destra); ©Luisa Lombardo, 2023

Infrastrutture, targhe, bacheche e identità visiva

Art. 32.1 - RAU
Segnaletica per informazioni e orientamento e segnaletica stradale

Per segnali di informazione e orientamento si intendono quei messaggi che facilitano l'uso dei servizi presenti in città, come: mappe cittadine del centro storico e dei parchi; mappe dei servizi pubblici, indicazioni di luoghi, strade, monumenti, eventi.

Art. 32.3 - RAU
Segnaletica per informazioni e orientamento e segnaletica stradale

La segnaletica per informazioni e orientamento del centro storico dovrà essere ben riconoscibile e coordinata con quella esterna al centro storico;

Art. 32.5 - RAU
Segnaletica per informazioni e orientamento e segnaletica stradale

Si abbia particolare cura nella scelta dei materiali e della grafica di simboli e caratteri per la segnaletica del centro storico, utilizzando forme e colori che tengano opportunamente conto dei caratteri specifici del luogo;

Art. 32.9 - RAU
Segnaletica per informazioni e orientamento e segnaletica stradale

È vietata l'istallazione di segnali di qualsiasi tipo, anche a carattere provvisorio, su elementi architettonici o di arredo urbano che abbiano un valore storico artistico;

Segnaletica di benvenuto: Cartello di accoglienza di nuova manifettura e congruo all'identità visiva di Polizzi Generosa

Segnaletica di benvenuto: Cartello di accoglienza di nuova manifettura e congruo all'identità visiva di Polizzi Generosa

Segnaletica di benvenuto: Cartello di accoglienza obsoleto e duplice; da sostituire

Segnaletica direzionale: Cartello direzionale dotato di grafica non consona al contesto; da sostituire

CARTELLA RAL Classic

Polizzi Generosa; ©Michele Tumminello, 2022

Gradazioni di Giallo

Gradazioni di Verde

Gradazioni di Grigio

Gradazioni di Marrone

Gradazioni di Bianco / Nero

RAL 9001	RAL 9002	RAL 9003
RAL 9004	RAL 9005	RAL 9006
RAL 9007	RAL 9010	RAL 9011
RAL 9012	RAL 9016	RAL 9017
RAL 9018	RAL 9022	RAL 9023

La necessità di sviluppare un piano urbano completo deriva dall'obiettivo di migliorare le condizioni del centro storico. Poiché manca un piano dettagliato che fornisca indicazioni specifiche su come preservare il patrimonio edilizio, si è dovuto ricorrere a un'applicazione diffusa e non selettiva dei colori predominanti della gamma RAL, ossia il giallo, il verde, il marrone, il bianco e il nero, in assenza di linee guida chiare. La proposta attuale tiene conto della possibilità di utilizzare colori che siano consoni al rispetto del tessuto urbano e architettonico.

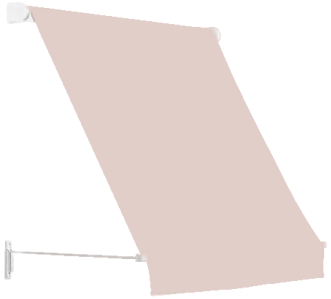
Negli anni passati, Polizzi Generosa non ha potuto sperimentare un programma di rinnovamento e cura degli edifici. Tuttavia, l'attenzione all'ambiente urbano rimane fondamentale, dato che numerosi edifici di valore storico e architettonico nel centro cittadino sono rimasti privi di qualsiasi intervento. La pulizia e la tinteggiatura degli edifici non solo donano ai cittadini una nuova visione di colori e luce, svelando dettagli precedentemente oscurati dalla polvere e dall'inquinamento, ma offrono anche l'opportunità ai proprietari di valorizzare le proprie proprietà.

Le tabelle proposte hanno come principale obiettivo il miglioramento dell'aspetto complessivo della città, la salvaguardia del patrimonio edilizio e, di conseguenza, la valorizzazione del paesaggio urbano. In modo indiretto, esse forniscono anche una guida e un controllo per assicurare la coerenza, la qualità e la continuità degli interventi. L'utilizzo dei colori dalla Cartella RAL (sia per le facciate che per altri elementi decorativi urbani) offre numerose possibilità di intervento nelle principali vie e piazze del centro storico.

Questa iniziativa coordinerà tutti i soggetti interessati, sia pubblici che privati, garantendo che tutte le opere vengano eseguite seguendo una stessa metodologia, contribuendo così a ripristinare l'immagine originale dell'intera area.

Individuazione di buone pratiche da seguire desunte da altri contesti

Ombrellone da poter utilizzare per il suolo pubblico



Esempio di tenda da sole a braccio da utilizzare per gli esercizi commerciali

Tende da sole, ombrelloni e parasole

L'arredo dei bar e dei ristoranti nello spazio urbano (o esterni negli spazi pubblici autorizzati) deve avere un aspetto in accordo all'immagine di alta qualità che si intende per il Comune di Polizzi Generosa al fine di garantire la tutela e la valorizzazione dello stesso.
Dando un margine di libertà per ciascun luogo, ma personalizzando ogni posto sempre cercando un criterio univoco, si raccomandano una serie di scelte possibili molto semplici per la selezione dell'arredamento da esterno.

OMBRELLONI

È fortemente raccomandato l'uso di **obrelloni da esterno** pieghevoli. Si consiglia che gli ombrelloni utilizzati in tutto il Comune siano della medesima caratteristica (dimensione, disegno, materiali e colore).

STRUTTURE PARASOLE

Le strutture parasole sono strutture leggere per la collocazione delle tensostrutture, situate negli spazi pubblici autorizzati per la sua occupazioneper tavoli da bar o ristoranti.
Devono essere strutture leggere autorizzate o costruite per il Comune nelle zone abilitate e formano parte del progetto di riqualificazione urbana.

Si terranno in considerazione le seguenti condizioni generali:

MATERIALI.
Si utilizzeranno preferibilmente teloni naturali o acrilici di aspetto naturale. I supporti, le aste e i meccanismi saranno preferibilmente in legno o in metallo non ossidabile o dipinto.

COLORI.
Saranno di un unico colore, lisci, senza strisce, in toni chiari (bianco crudo o crema).

POSTAZIONE.
Si collocheranno al di sopra del pavimento senza recare danno ai basolati storici.

NETRAULITÀ.
Non devono avere alcun tipo di logo, ne marca pubblicitaria.

DIMENSIONE E FORMATO.
Potranno essere a pianta quadrata, circolare o poligonale, di dimensioni variabili, dimetro massimo 4 metri. Senza gonne e frange.

Arredo Urbano

L'esempio di arredo urbano Ortigia, un bar del centro storico

L'esempio di arredo urbano di Ragusa Ibla, un bar del centro storico

Le **sedie** che concorreranno all'abbellimento del centro urbano, negli spazi esterni, è preferibile che siano di uno di questi materiali: legno, legno e acciaio, vimini o materiali naturali analoghi.

Sono ammessi anche quelli con struttura in alluminio e acciaio inossidabile preferibilmente accoppiati con legno o materiali analoghi, in questo caso si ammettono anche quelli con fibre plastiche per facilitare il mantenimento.

I **tavoli** potranno essere di legno, con sopra del bianco o del vetro. Sono adeguate anche le strutture di alluminio, argento opaco e legno, alluminio o laminato idrorepellente.

La scelta dei materiali e degli arredi, se condivisa dalla totalità degli esercenti del luogo, restituisce un'ottima immagine al tessuto urbano nel suo complesso. Tali soluzioni, altresì, si pongono in linea con una delle raccomandazioni che l'UNESCO ha recentemente rivolto all'Italia riguardo il decoro e l'uniformità degli arredi urbani al fine di valorizzare maggiormente i centri storici.

Le piazze sono uno dei principali punti di forza dell'offerta turistica soprattutto dei borghi e sono parte del patrimonio culturale del Paese. Salvaguardarne l'immagine è prioritario.

Esempio di sedia da poter utilizzare per occupare il suolo pubblico

Abbattimento delle barriere architettoniche e accessibilità allargata

Art. 65 - Reg. Ed.
Barriere architettoniche

Per facilitare la vita di relazione di tutti i cittadini, compresi gli anziani o i portatori di minorazioni, sulla base di quanto contenuto e prescritto dalla vigente legislazione nazionale regionale, le soluzioni progettuali urbanistico-edilizie devono tendere alla eliminazione delle cosidette "barriere architettoniche", cioè degli ostacoli di natura fisica o psicologia che incontrano le persone con ridotte o impedite capacità motorie nel muoversi nell'ambito degli spazi urbani, delle attrezzature ovvero delle strutture edilizie.

Tali ostacoli sono costituiti essenzialmente da elementi altimetrici che si incontrano lungo i percorsi (gradini, risalti, dislivelli, scale, ecc...) ovvero da esiguità di passaggi e ristrettezza di ambienti (strettoie, cabine di ascensori, aperture di porte, ecc...)

Categoria A: le norme di questa categorie, in base alla vigente legislazione nazionale, devono essere applicate per la costruzione, ristrutturazione o la modificazione di impianti, edifici e/o attrezzature pubbliche o aprte al pubblico, di istituzioni scolastiche, prescolastiche o di interesse collettivo-sociale (amministrativo, culturale, giudiziario, economico, sanitario, ricreativo, comunitario, ecc...);

Categoria B: le norme di questa categoria devono essere aplicate su tutte le costruzioni e/0 attrezzature private, non rientranti nella precedente categoria A.

All'interno degli edifici ovvero negli spazie esterni, l'esistenza di particolari percorsi o di specifiche attrezzature, accessibili anche agli handicappati su sedie a rotelle, deve essere chiaramente individuato e segnalato mediante l'apposito simbolo internazionale dell'accesso, che costituisce l'allegato A del DPR 27 Aprile 1978, n° 384.

Il tema dell'accessibilità oggi suscita grande interesse soprattutto per quei piccoli luoghi, come i borghi, che necessitano di una progettazione adeguata per la popolazione che vi stanzia, per lo più anziana.

È opportuno, dunque, trovare soluzioni tecnologiche che garantiscano un'accoglienza e un'ospitalità specializzata non solo per i turisti, ma anche per gli abitanti.

L'implementazione di percorsi tattili e plantari, di rampe e corrimano per affrontare le lunghe, tortuose e ripide scalinate di Polizzi Generosa; una progettazione tecnologica sostenibile e compatibile volta ad aiutare qualsiasi tipologia di utente alla fruizione dell'ambito urbano è la chiave per riportare i borghi ad una condizione di contemporaneità.

Sistemi di audio guida, circuiti riservati a chi ha difficoltà motorie e uditive, percorsi tattili assistiti e le indicazioni per raggiungere i punti di interesse, compresi bar, ristoranti e toilette, una rete di servizi, di strutture e di infrastrutture che consentono alle persone di trascorrere il tempo libero senza ostacoli.

Di seguito, alcune soluzioni tecnologiche innovative per l'ambito valenciano volte al miglioramento dell'accessibilità che è possibile implementare nell'ambito territoriale di Polizzi Generosa.

Alcuni presidi tecnologici per migliorare l'accessibilità a Polizzi Generosa; ©Luisa Lombardo, 2023

1. Mappe tattili; 2. 3. Pannello informativo degli itinerari accessibili per persone con disabilità motorie; 4. 5. Soluzioni per la mobilità all'interno del centro urbano e il recupero dell'acqua piovana; 6. Soluzione per l'innesto di vegetazione e conseguente raccolta delle acqua piovane.
Disegni tratti dal *Manuale delle soluzioni tipo* in "Studio degli itinerari dotati di accessibilità universale, negli spazi pubblici della comunità valenciana" - Comune di Valencia

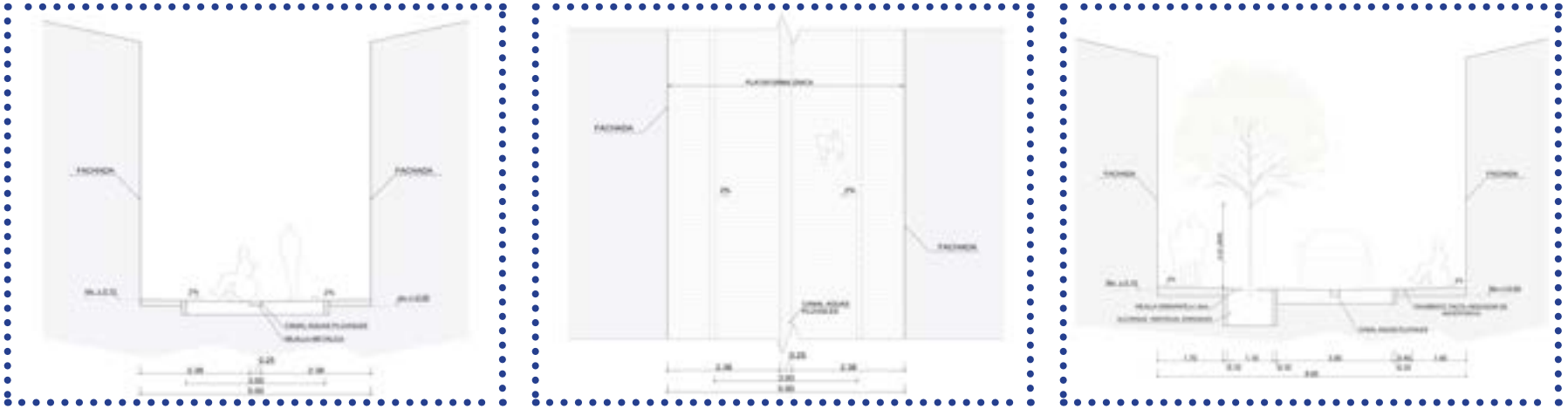


TAVOLA SINOTTICA DEGLI INTERVENTI

INTERVENTO N°1

PRIMA

DOPO

INTERVENTO N°2

PRIMA

DOPO

INTERVENTO N°3

PRIMA

DOPO

INTERVENTO N°4

PRIMA

DOPO

INTERVENTO N°2

STATO DI FATTO

- Pluviale posizionato in prospetto e con materiali ossidati;
- Fili elettrici disordinati in prospetto;

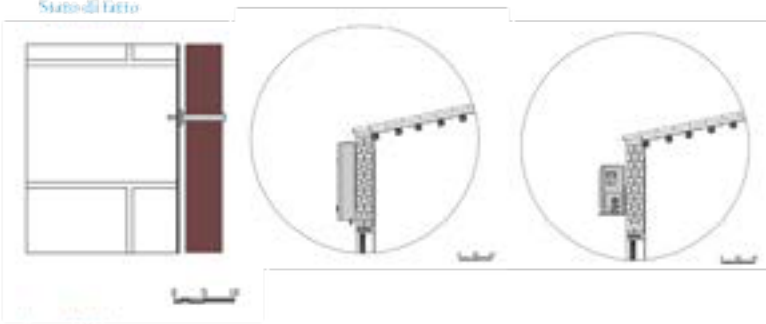
IPOTESI DI INTERVENTO

- Predisposizione di un nuovo pluviale in coppi;
- Predisposizione di un pluviale con colorazione dell'intonaco;
- Predisposizione di un pluviale ad incasso nella muratura;
- Predisposizione di un nuovo pluviale per nascondere i cavi elettrici;

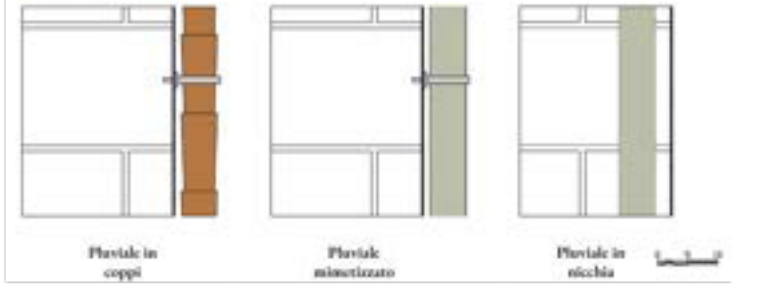
APPROFONDIMENTI TECNOLOGICI

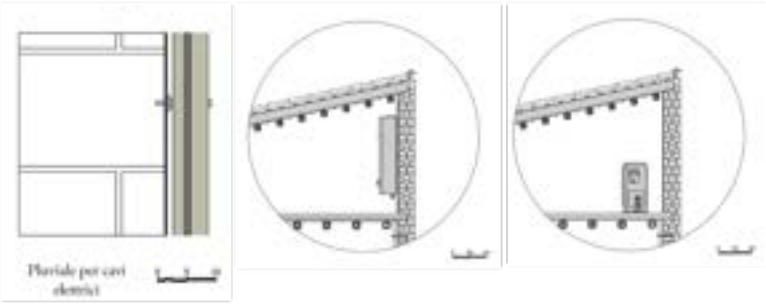
PLUVIALI SUL FRONTE ARCHITETTONICO

Stato di fatto



Ipotesi di intervento





RACCOMANDAZIONI

Ai fini del mantenimento dei caratteri materico-costruttivi dell'area è opportuno che, nel caso in cui debba essere recuperato un edificio, il nuovo pluviale sia realizzato come da tradizione in laterizio tramite la disposizione di coppi troncoconici. Nel caso di trovarsi nell'impossibilità di poter eseguire tale pratica di recupero, è possibile anche utilizzare pluviali in pvc o lamierino purchè il colore sia da tabella RAL Nero/Grigio oppure ridipinto come da colore del prospetto come da RAL Giallo. Nel caso di nuovo pluviale e, nel caso in cui i cavi elettrici siano disordinari, è possibile prevedere il loro inserimento all'interno, oppure, prevederne una disposizione ordinata all'interno di apposita traccia o nicchia.

Per quanto concerne la caldaia, l'implementazione tecnologica è fortemente consigliata in locali tecnici dell'edificio o in nuovi vani tecnici ricavati sottotetto. Medesima pratica è consigliata anche per le unità esterne degli impianti di condizionamento.

INTERVENTO N°3

STATO DI FATTO

- Presenza di serbatoi in copertura;

- Presenza conduttura del gas nel prospetto;

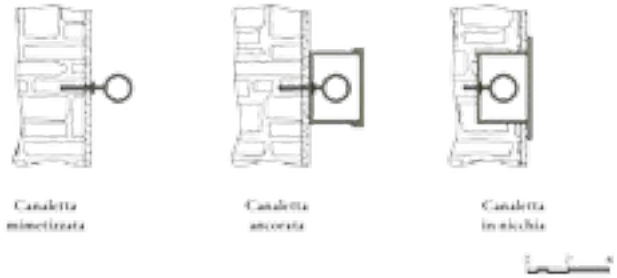
IPOTESI DI INTERVENTO

- Rimozione dei serbatoi in copertura e disposizione all'interno di vani tecnici o interrati;

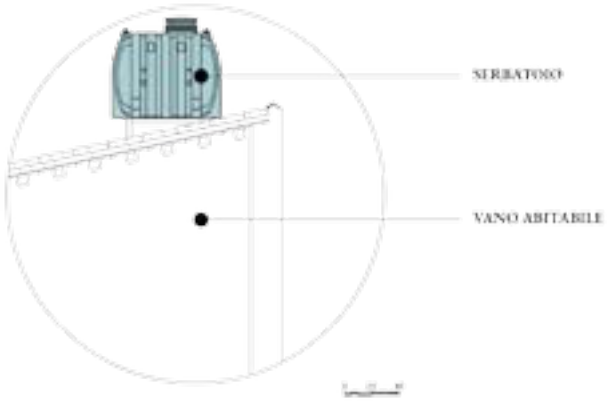
- Inserimento della conduttura del gas all'interno della muratura o rientrata con griglia di aereazione;

APPROFONDIMENTI TECNOLOGICI

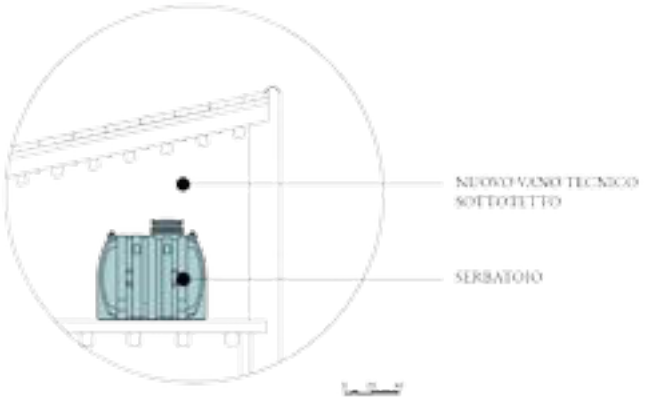
INSERIMENTO DELLA CANALETTA DEL GAS NELLA MURATURA



RIMOZIONE DEL SERBATOIO IDRICO IN COPERTURA
Stato di fatto



Ipotesi di intervento



RACCOMANDAZIONI

Per ottenere maggior decoro architettonico, è opportuno tinteggiare le tubazioni del gas, posizionate generalmente nella fronte architettonica principale, con il medesimo colore della finitura del paramento murario, oppure prevedere l'ancoraggio attraverso una canaletta, o ancora prevedere, tramite la predisposizione di una piccola traccia, una nicchia di alloggiamento volta ad inserirlo a filo muro.

Ai fini dell'impatto paesaggistico, i serbatoi posizionati nel tetto devono essere occultati e posizionati in posizioni non visibili. Si raccomanda lil loro posizionamento all'interno di vani tecnici da posizionare nel sottotetto (come da approfondimento tecnologico), o, in egual maniera in vani tecnici esistenti dell'immobile oppure (se disponibile un'area idonea attorno all'edificio) interrati.

INTERVENTO N°4

STATO DI FATTO

- Presenza di serbatoi in copertura;
- Assenza di affacci verso l'esterno;

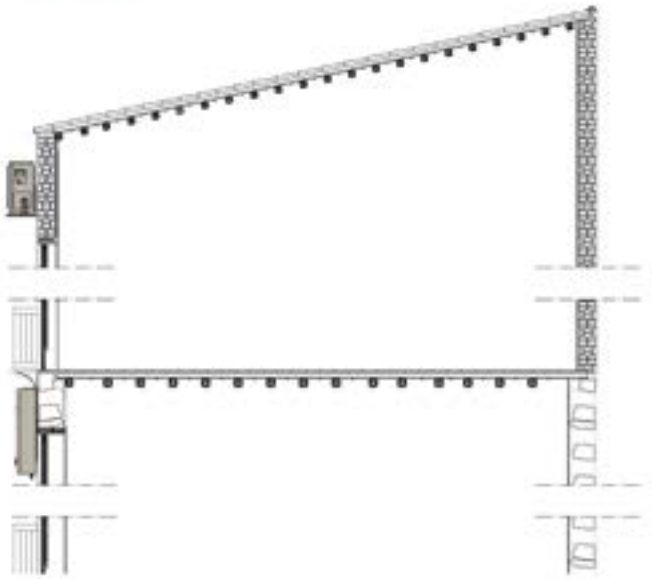
IPOTESI DI INTERVENTO

- Presenza di serbatoi in copertura;
- Assenza di affacci verso l'esterno;

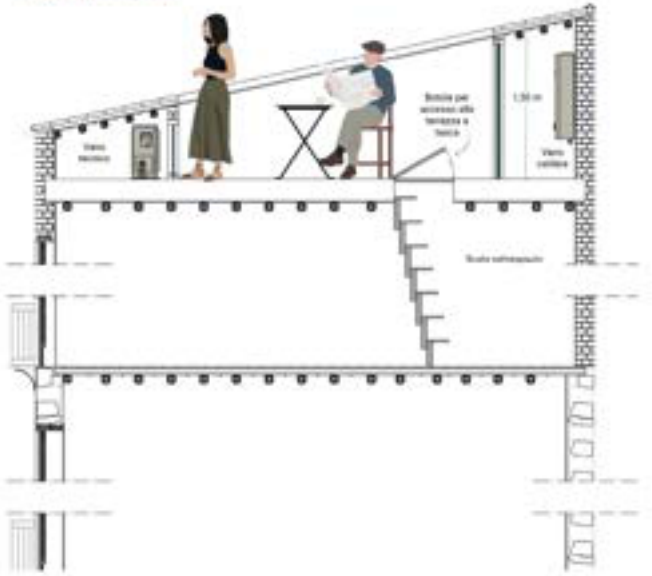
APPROFONDIMENTI TECNOLOGICI

PREDISPOSIZIONE DI TERRAZZA A TASCA O A POZZO

Stato di fatto



Ipotesi di intervento

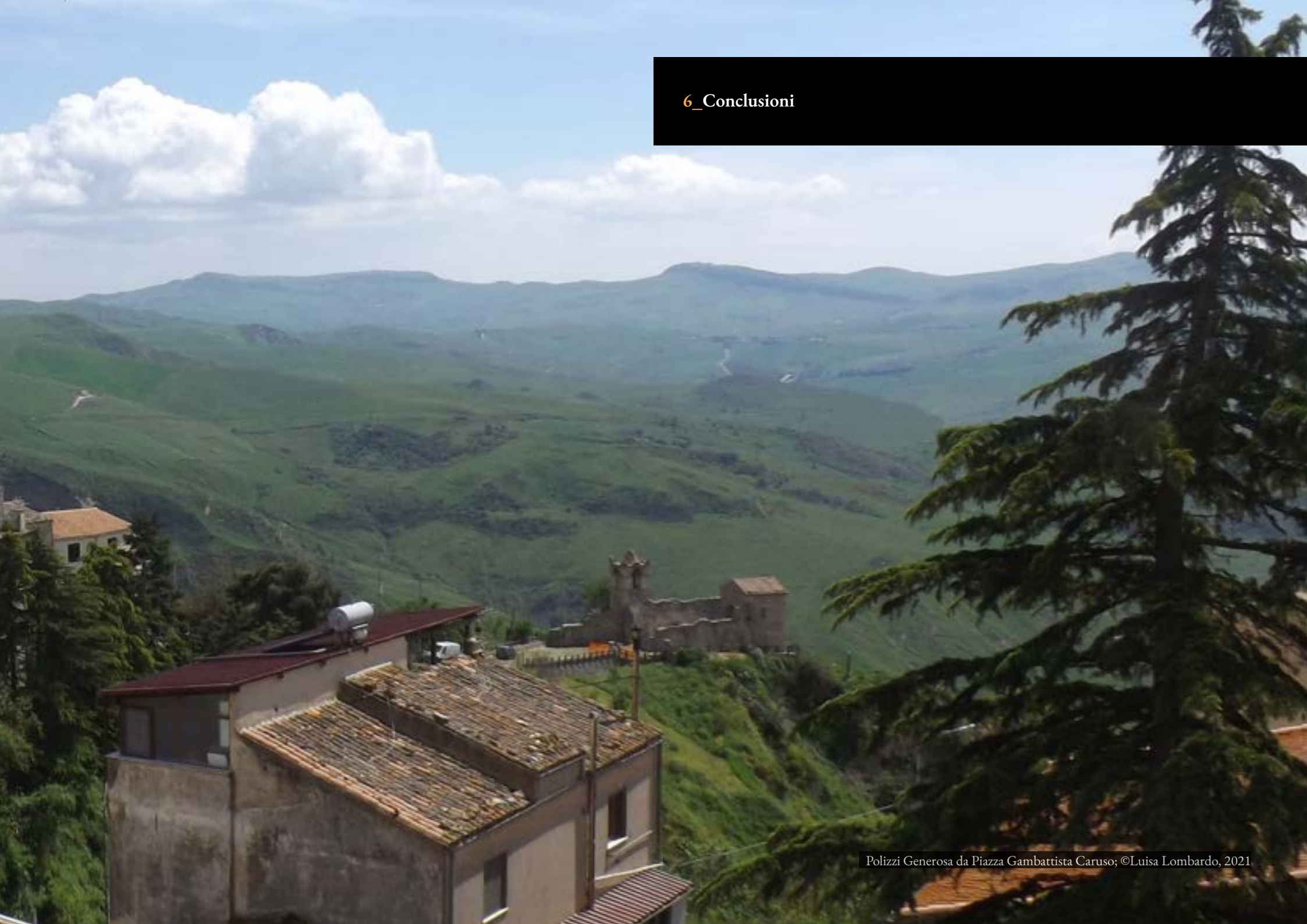


RACCOMANDAZIONI

Ai fini dell'impatto paesaggistico, i serbatoi posizionati nel tetto devono essere occultati e posizionati in posizioni non visibili. Si raccomanda lil loro posizionamento all'interno di vani tecnici da posizionare nel sottotetto (come da approfondimento tecnologico), o, in egual maniera in vani tecnici esistenti dell'immobile oppure (se disponibile un'area idonea attorno all'edificio) interrati. (vedi Intervento n°1)

Per andare incontro ad esigenze del luogo ed avere una mimetizzazione degli impianti tecnologici, ma al contempo, un affaccio verso l'esterno, è possibile prevedere la costruzione di idonee terrazze a tasca o a pozzo. L'accesso alle stesse può avvenire tramite piccole scale salvaspazio (presenti in grande quantità nel mercato) con una botola che da accesso al terrazzo. La predisposizione della terrazza a tasca permette, in particolare, la possibilità di sfruttare la copertura nelle giornate di sole, ma anche la predisposizione degli impianti tecnologici quali caldaie o unità esterne degli impianti di condizionamento che altrimenti figurerebbero in prospetto. Si raccomanda, inoltre, l'utilizzo di un'adeguata pendenza per migliorare lo smaltimento della neve durante i periodi più rigidi e un sistema di aereazione e di aperture volte allo smaltimento dei gas dei presidi tecnologici.

6_Conclusioni



Polizzi Generosa da Piazza Gambattista Caruso; ©Luisa Lombardo, 2021

Le Linee Guida presentate esplorano la possibilità di coniugare tradizione e innovazione nel contesto costruito dell'area interna siciliana, concentrandosi sul Comune di Polizzi Generosa, uno dei 21 centri minori del Parco delle Madonie.

Questo caso pilota ha l'obiettivo di applicare un modello che possa essere esteso anche ad altri territori, al fine di tutelarli e valorizzarli, rispettando le tradizioni costruttive locali e promuovendo, al contempo, l'innovazione.

In particolare, il lavoro si è basato sulla consapevolezza che la conservazione e la valorizzazione del patrimonio culturale devono andare di pari passo con lo sviluppo di nuove soluzioni tecnologiche, in modo da garantire un equilibrio tra il rispetto per il passato e le esigenze di un futuro sostenibile.

Le normative locali, come il "Regolamento Comunale Arredo Urbano", insieme alle Linee Guida e alle principali convenzioni internazionali (Convenzione di Faro, Convenzione di ICOMOS e il concetto di "*baukultur*"), hanno fornito il quadro normativo e teorico per il presente studio.

Le principali conclusioni riguardano:

- **Tradizione e innovazione:** la conservazione del patrimonio e il suo adattamento alle necessità contemporanee possono essere compatibili, se si promuove una gestione attenta e mirata, rispettosa delle tecniche costruttive tradizionali ma anche aperta all'adozione di nuove tecnologie.
- **Partecipazione pubblica:** la valorizzazione del patrimonio culturale richiede una partecipazione attiva della comunità, come sottolineato dalla Convenzione di Faro. Il coinvolgimento degli abitanti di Polizzi Generosa è stato fondamentale non solo nella raccolta di materiali e fotografie, ma anche nell'assunzione di un ruolo attivo nella tutela e gestione del paesaggio urbano.
- **Gestione sostenibile:** le diverse normative e concetti presentati, da ICOMOS alla "baukultur", enfatizzano l'importanza di una gestione sostenibile del patrimonio costruito, che deve considerare l'aspetto estetico, culturale e sociale, ma anche la sostenibilità economica e ambientale delle soluzioni adottate.
- **Il ruolo della comunità accademica:** il contributo della ricerca dottorale e delle tesi di laurea sviluppate da giovani studiosi ha arricchito questo lavoro, sottolineando l'importanza della collaborazione tra enti locali, accademici e cittadini per un approccio integrato alla valorizzazione del patrimonio.

Le Linee Guida proposte, oltre a costituire un punto di riferimento per la gestione e la valorizzazione del patrimonio costruito, si pongono come uno strumento utile per tecnici, imprese e cittadini, permettendo loro di comprendere le peculiarità territoriali e di agire con criterio nelle operazioni di conservazione, recupero e valorizzazione del patrimonio architettonico e paesaggistico.

La loro applicazione mira a garantire un intervento rispettoso e armonico con il contesto locale, promuovendo un approccio consapevole e informato nella gestione del territorio.

Il progetto di Polizzi Generosa si inserisce in un più ampio quadro di tutela del patrimonio culturale e paesaggistico, dove tradizione e innovazione non sono contrapposte, ma piuttosto devono essere viste come strumenti complementari per garantire la sostenibilità e la vitalità di comunità locali. L'applicazione di questo modello ad altri contesti potrebbe rappresentare una buona pratica per la gestione del patrimonio rurale e montano in Sicilia e in altre aree mediterranee.

Inoltre, è importante sottolineare che, caso per caso e a partire dagli esempi proposti, ogni soluzione, valutata sulla base dell'analisi del patrimonio architettonico, deve costituire un riferimento per orientare le scelte tecnologiche e progettuali sia in ambito di manutenzione ordinaria che straordinaria. Tali soluzioni possono essere gestite dal singolo utente o proprietario, nonché dal tecnico, dall'impresa o dall'azienda incaricata dell'esecuzione dei lavori.

Le Linee Guida seguono la metodologia dei seguenti manuali di recupero dell'area valenciana:

VEGAS, F., & MILETO, C. (2007). *Renovar conservando. Manual para la restauración de la arquitectura rural del Rincón de Ademuz.*

BALAGUER, P., & VICEN, L. (2011). *La arquitectura popular de Peñíscola. Manual de restauración del centro histórico.*

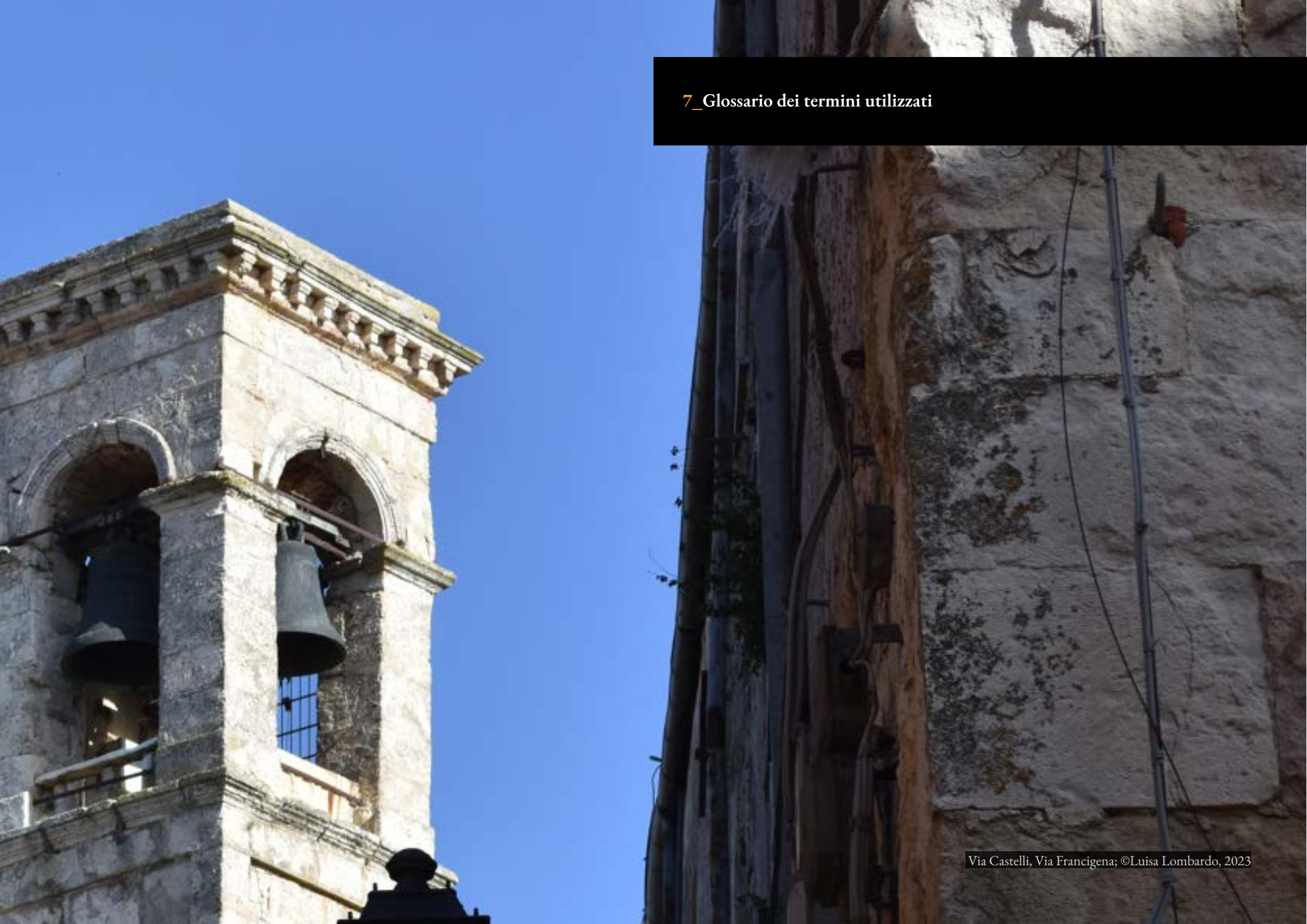
AICART QUERALT, J. M. (2020). *Patrimoni arquitectònic de Benicarló. La memoria compartida. Onda Edicions.*

ARQUER, N., LINARES, J. C., & PALMER, J. (2020). *Manual de buenas prácticas constructivas del centro histórico de Borriol.*

MILETO, C., & VEGAS, F. (2023). *Rehabilitando El Cabanyal. Un recorrido arquitectónico por el barrio de El Cabanyal.*

Polizzi Generosa dal drone; ©Carmelo Di Salvo, 2021

7_Glossario dei termini utilizzati



Via Castelli, Via Francigena; ©Luisa Lombardo, 2023

annito, andito s. m. [lat. mediev. anditus, prob. der. di andare sull'analogia di altre voci lat. come adĭtus, transĭtus]. – Corridoio, o in genere ambiente secondario di passaggio e disimpegno, in case d'abitazione. Per estens., non com., bugigattolo, angolo riposto: frugarono in tutti gli a. della casa. ♦ Dim. anditino; spreg. anditùccio**.** *[Enciclopedia Treccani]*

appenditore s. m. - Sistema di aggancio e sospensione utile all'ancoraggio del sistema costruttivo principale.

arcaréccio s. m. [der. di arco] – nell'orditura alla lombarda dei tetti in legno (v. orditura), ciascuna delle travi orizzontali parallele alla gronda che, appoggiate ai puntoni delle capriate o ai muri di timpano, sorreggono i travicelli sui quali è sistemato il manto di copertura. *[Wikitecnica Tecknoring]*

basolato s. m. [der. di basolo]. – Pavimentazione stradale fatta con basoli. *[Enciclopedia Treccani]*

cantonale s. m. - Zona dell'apparecchio murario che consente l'ammorsatura angolare fra muri perimetrali della fabbrica. Ai cantonali è affidato il compito di garantire solidarietà fra le pareti d'ambito e assicurare un buon comportamento d'insieme alla scatola muraria. Per via dell'importante ruolo statico rivestito, ai cantonali sono, di solito, riservati un impegno e un'accuratezza costruttiva maggiori, che comportano la disposizione di elementi lapidei più grandi e lavorati più accuratamente. Nelle murature, con apparecchiatura sia regolare che irregolare, il cantonale è infatti realizzato con elementi lapidei, più o meno squadrati (conci o bozze), sovrapposti in modo mutuamente ortogonale. A volte il cantonale, enfatizzato, diviene a pieno titolo un elemento del lessico formale e connota l'impaginato architettonico dei fronti. Cantonali decorati a bugna, infatti, caratterizzano l'edilizia civile con più evidenza a partire dal Rinascimento. I più comuni sono quelli a bugna rettangolare, con spigoli squadrati, o a cuscino con angoli arrotondati, dotati di superfici lisciate (bugna liscia) o bocciardate (bugna rustica). Bugne a sezione piramidale (bugne "a punta di diamante") caratterizzano invece le angolate del Palazzo dei Diamanti a Ferrara e sono presenti anche in molti edifici meridionali, dove i temi rinascimentali si fondono con influenze dello stile plateresco spagnolo (Palazzo Steripinto a Sciacca, XVI secolo; Palazzo della Giudecca a Trapani, XVI secolo). In altri esempi, invece, il cantonale è realizzato con pietre aggettanti disposte a scacchiera (Palazzo Gagliardo a Polizzi Generosa, in provincia di Palermo, XVI secolo) o ancora tramite la bicromia di elementi lapidei diversi. *[Enciclopedia Treccani]*

cappuccina s. f. - Tipologia di elemento di coronamento di un edificio (cornicione consistante in con filari di coppi sovrapposti e via via maggiormente aggettanti da 2 a 7 filari.

carpenteria s. f. [der. di carpentiere]. Nelle costruzioni, denominazione generica delle strutture di legno o di metallo, con funzione portante, fatte riunendo in varî modi e con diversi mezzi elementi separati, spesso concorrenti in nodi. *[Enciclopedia Treccani]*

caténa s.f. - Nelle costruzioni civili, particolare elemento, o tirante, di alcune strutture (capriate, archi, volte) sottoposto prevalentemente a trazione; anche, la sbarra di ferro che si introduce nelle murature pericolanti per collegarle ad altre più resistenti. *[Wikitecnica Tecknoring]*

centinatura s. f. [der. di centinare]. – 1. a. Complesso di operazioni occorrenti per armare di centina: la c. di una volta, di un arco. b. Insieme di centine disposte per costituire l'armatura di un sistema di archi a volte. 2. Sagomatura di archi considerata nella sua forma geometrica particolare: una c. a sesto acuto. *[Enciclopedia Treccani]*

codice s. m. - Nel linguaggio giuridico, il codice è una raccolta organica e sistematica che comprende tutte le leggi che riguardano un ramo del diritto (c. civile, penale; c. della strada); 5. più in generale, è un codice qualsiasi insieme di norme, che può essere scritto o anche soltanto legato a una tradizione e a consuetudini di comportamento (c. cavalleresco, deontologico; il c. del galateo). *[Enciclopedia Treccani]*

cóppo s. m. – tegola curva, leggermente conica, usata, in disposizione a file parallele, per coperture di tetti. *[Enciclopedia Treccani]*

cornicióne s. m. [accr. di cornice]. – cornice di co-

N.B. Nel presente glossario sono riportati i termini che compaiono progressivamente all'interno di queste Linee Guida. Quando esiste una definizione consolidata in letteratura, è stata indicata la relativa fonte. In assenza di una definizione ufficiale, vocabolario o prontuario tecnico, i termini sono stati descritti e spiegati per garantire chiarezza e comprensione.

ronamento degli edifici con funzione di elemento terminale di una facciata di notevole altezza e di importanza monumentale, soprattutto nell'architettura civile dal Rinascimento all'Ottocento (permane talora nell'architettura moderna con funzione protettiva). *[Enciclopedia Treccani]*

edilizia di base - col termine edilizia di base si intende la parte di costruito destinata all'abitazione. L'abitazione è, infatti, la prima e fondamentale forma di spazio edificato della quale, nel tempo, l'uomo conserva la nozione più spontanea. *[def. Prof. Giuseppe Strappa]*

émbrice s. m. [lat. ĭmbrex -brĭcis, der. di imber -bris «pioggia»]. – tipo di tegola di forma rettangolare senza risalti, ovvero di forma trapezoidale con bordi rialzati sui due lati obliqui, usata, quest'ultima, nelle coperture a tetto dette «alla romana». *[Enciclopedia Treccani]*

estradòsso s. m. [comp. di estra- e dosso, modellato sul fr. extrados]. – 1. In architettura, superficie esterna della struttura di una volta, o di un arco; non è visibile nelle volte interamente ricoperte dalle murature di rinfianco, è evidente invece nelle volte dette appunto estradossate, nelle quali la struttura resistente resta superiormente libera. Si contrappone a intradosso. *[Wikitecnica Tecknoring]*

fornace s. f. [lat. fornax -acis, prob. affine a formus «caldo»]. – Opera, per lo più in muratura, destinata alla cottura di calcari, gesso, argilla e sim., per la preparazione di materiali da costruzione; il termine è ora sostituito, soprattutto nell'uso tecnico, da forno. Come termine di similitudine, e in usi fig., di ambiente ove faccia un caldo eccessivo: sembrava d'essere in una f.; d'estate, queste stanze diventano una fornace. *[Enciclopedia Treccani]*

impalcato s. m. [part. pass. sostantivato di impalcare]. – Nella tecnica delle costruzioni, struttura di copertura costituita da un tavolato sorretto da travi di legno, per lo più per formare un solaio o un soffitto; anche, l'insieme delle strutture lignee (o metalliche) di cantiere occorrenti all'esecuzione di opere murarie. In partic., l'insieme delle strutture di sostegno orizzontale (in ferro o in cemento armato) del piano stradale di un ponte. *[Enciclopedia Treccani]*

incannucciata s. f. [der. di incannucciare]. – 1. Leggera struttura di canne intrecciate o altrimenti tenute insieme, adoperata come recinzione o come sostegno di piante rampicanti nei pergolati, frequente nel Lazio nelle osterie di campagna (che talvolta da essa prendono il nome: Osteria dell'incannucciata); è usata anche nelle costruzioni come armatura (su scheletro portante ligneo) di soffitti e volte decorate di stucco (in questa accezione è detta anche incannicciatura o camera a canna), oggi però generalmente sostituita da una sottile rete metallica. 2. Fasciatura rafforzata con stecche o assicelle, usata un tempo per la cura delle fratture. *[Enciclopedia Treccani]*

intradòsso s. m. [comp. di intra- e dosso, modellato sul fr. intrados]. – 1. La superficie inferiore, in vista, di un arco o di una volta; anche la superficie interna (o imbotte) del vano di una porta o di una finestra, corrispondente allo spessore di un muro. Linea di i., la curva d'intersezione dell'intradosso con un piano verticale contenente l'asse dell'arco. *[Enciclopedia Treccani]*

laterìzio agg. e s. m. [dal lat. latericius, agg., der. di later -ĕris «mattone»]. – 1. agg. a. Di terracotta, di mattoni: materiale l.; opera l.; strutture l., ecc.; industria l., che riguarda la fabbricazione dei laterizî. Bolli l., marchi di fabbrica, recanti spesso le date consolari, con cui nell'antica Roma si bollavano i mattoni e le tegole. b. Per estens., in medicina, sedimento l., sedimento urinario, di colore rosso mattone, dovuto a precipitazione di urati amorfi, osservabile spec. nelle urine di malati febbrili. 2. s. m. Denominazione generica di materiali artificiali da costruzione, per lo più di colore vivo e grana compatta, formati da argilla contenente quantità variabili di sabbia, ossido di ferro e carbonato di calcio che, purgata, macerata e impastata, da sola o mescolata a sostanze smagranti (sabbia, scorie), viene foggiata in pezzi di forma e dimensioni prestabilite, cotti, dopo asciugamento, in apposite fornaci: l. pieni (detti comunem. mattoni), a forma di parallelepipedo, usati per murature portanti, pareti perimetrali, ecc.; l. da paramento, di prima scelta, usati per opere in vista; l. forati (o, assol., forati), muniti di fori che li attraversano longitudinalmente, usati per solai, tramezzi, soffitti, tamponature (mattoni forati, tavelloni, tavelle, volterrane, pignatte, copri-

ferri), o perpendicolarmente alla massima superficie, per pareti portanti leggere (cosiddetti mattoni alleggeriti); l. speciali, che comprendono blocchi alveolati ad alta coibenza e blocchi per muratura armata: questi ultimi muniti di fori che formano in opera cavità atte a contenere barre d'acciaio verticali da cementare con un getto di calcestruzzo. *[Enciclopedia Treccani]*

lavorazióne s. f. [der. di lavorare; cfr. lat. tardo laboratio -onis «lavoro, sforzo»]. – L'operazione e la tecnica del lavorare una materia per darle la forma e l'aspetto voluti: la l. del metallo, del legname, della lana, del cuoio, del marmo; le varie fasi della l. delle fibre tessili; metodo, sistema di l.; l. di maglieria, a mano o a macchina; e il modo con cui tale operazione è stata o viene eseguita, e quindi il risultato ottenuto: è una l. perfetta, o difettosa, scadente; il materiale è buono, ma la l. non mi soddisfa; si garantisce una l. accurata. Anche di opere alla cui produzione occorre tutto un complesso di operazioni e attività varie: iniziare la l. (e attendere alla l., sospendere la l.) di un film. Nell'uno e nell'altro caso, essere in l. (e parallelamente avere in l.), espressione di uso corrente per indicare che il lavoro è stato iniziato ed è tuttora in corso: il suo vestito è in l. e sarà pronto per la prova entro la prossima settimana; abbiamo in l. una serie di documentarî televisivi sulle pitture murali. Con riguardo alle tecniche seguite, si distinguono, nelle lavorazioni meccaniche: l. con asportazione di truciolo, eseguite a freddo, manualmente o con macchine utensili, e l. senza asportazione di truciolo, che possono essere per deformazione plastica, a caldo o a freddo, compiute attraverso laminazione, trafilatura, estrusione, ecc., oppure per fusione, portando cioè i materiali allo stato liquido e colandoli in apposite forme. Nell'organizzazione di lavori complessi, da compiere su più pezzi e in più fasi, si chiama l. fluente o più spesso a catena quella che si effettua disponendo gli operai lungo un nastro trasportatore sul quale viene fatto avanzare il pezzo da lavorare. Per la l. in serie, v. serie. *[Enciclopedia Treccani]*

listèllo s. m. [dim. di lista]. – 1. a. Genericam., sottile striscia di legno (o anche di altro materiale), usata per ornamentazione, per rinforzo, per colmare una commessura, o in un lavoro d'intarsio, ecc. b. Nelle costruzioni in legno, sinon. di cantinella. 2. In architettura, modanatura costituita da una sottile superficie verticale piana, aggettante o rientrante rispetto ad altre modanature (di profilo curvo o piano) ad essa adiacenti, e talora variamente decorata così da costituire un elemento ornamentale preminente. *[Enciclopedia Treccani]*

muratura s.f. – Struttura muraria costituita di elementi (pietra, laterizio) sovrapposti gli uni agli altri con l'interposizione o meno di un materiale cementante che, riempiendo i vani della m., ne collega la massa; le caratteristiche tecniche che qualificano una m. possono riferirsi ai materiali adoperati (m. di pietra, di mattoni, di cemento, mista, a secco ecc.), alla lavorazione (m. a faccia vista, a spina di pesce, a cortina di mattoni ecc.), alle funzioni costruttive (m. di fondazione, di rinforzo ecc.) o di altri aspetti particolari dei singoli edifici. La struttura muraria ha, per costituzione, resistenza praticamente nulla agli sforzi di trazione indotti dalle sollecitazioni esterne, mentre ha una buona resistenza alla compressione: ne deriva che m. di dimensioni anche ridotte, purché fondate razionalmente sopra un piano di posa consistente, possono sopportare notevoli carichi verticali (muri di edifici ordinari), mentre le m. soggette a forze orizzontali (muri di sostegno, dighe a gravità ecc.) richiedono spessori anche molto notevoli, a causa dei momenti flettenti generati nel loro interno da quelle forze. Per la completa eliminazione degli sforzi di trazione è infatti necessario che in ogni sezione orizzontale del muro la risultante delle forze orizzontali e dei carichi verticali (peso della m. sovrastante e di eventuali strutture che gravino su essa) sia applicata in un punto interno al nocciolo di inerzia della sezione stessa. Data l'interposizione della malta, che ha una minore resistenza alla compressione, la m. presenta una resistenza notevolmente inferiore a quella corrispondente alla pietra o al laterizio che la costituiscono. In alcuni casi, oltre alla resistenza meccanica, interessano le caratteristiche di resistenza ad agenti atmosferici, chimici ecc. *[Enciclopedia Treccani]*

parete cieca s.f. - per pareti cieche si devono intendere pareti prive di finestre e prive di qualsiasi apertura per luci e vedute. *[Glossario Economico-Immobiliare - Sezione I: FABBRICATI ED AREE EDIFICABILI]*

pianèlla s. f. [der. di piano1]. – Mattonella di lateri-

zio usata come materiale da pavimentazione, spesso rivestita con uno strato superficiale di vetrina per ottenere un aumento della resistenza all'usura: tetto, pavimento a pianelle. *[Enciclopedia Treccani]*

piattabanda s.f. [dal fr. plate-bande, propr. «banda piatta»] (pl. piattabande o piattebande) Nelle costruzioni edilizie, elemento strutturale che delimita superiormente vani di porte o di finestre (di luce non molto grande), costituito da una serie di mattoni (o di pietre da taglio) disposti per ritto e saldati l'uno all'altro da uno strato di malta cuneiforme in modo da formare un arco molto ribassato che scarica sulle spalle il peso sovrastante. Anche, impropriam., architrave di ferro o cemento armato, posto sopra i vani aperti nei muri portanti. *[Enciclopedia Treccani]*

piedritto s. m. [comp. di piede e dritto1]. – Nelle costruzioni, qualunque elemento verticale di una struttura soggetto a sforzi di compressione indotti dal peso sostenuto, e a spinte orizzontali provocate da forze esterne: ne sono esempî in un ponte le spalle e le pile, in una galleria le pareti laterali, in un portale le colonne o i pilastri, ecc. *[Enciclopedia Treccani]*

regola d'arte - formula logora, che rimanda a capitolati d'appalto e a botteghe artigiane, termine consumato e ormai lontano dal significato originario, ma non smesso, ancora presente nell'immaginario collettivo degli addetti ai lavori. Permane, nell'accezione corrente, il significato di corretta esecuzione; la regola dell'arte viene quasi sempre riferita, infatti, ad una tecnicità, ad una destrezza manuale, ad una riconoscibile attitudine artigiana. *[a cura di LUCIANO SEMERANI, Dizionario critico illustrato delle voci più utili all'architetto moderno, Edizioni C.E.L.I., Faenza, 1993]*

regolamento edilizio s.m. - un regolamento edilizio è lo strumento normativo e non urbanistico che perciò norma a livello comunale le modalità costruttive della edificazione, garantendo il rispetto delle normative tecnico-estetiche, igienico-sanitarie, di sicurezza e vivibilità degli immobili e delle pertinenze degli stessi. *[Enciclopedia Wikipedia]*

rinzaffo s. m. [der. di rinzaffare]. – Riempimento con malta dei giunti e di altre cavità presenti nella muratura di pietrame, in modo da portarne in piano la faccia vista, pronta per l'applicazione dell'intonaco. Il termine è anche genericam. impiegato per indicare il primo strato di malta che viene disteso sulle pareti murarie nell'applicazione dell'intonaco. *[Enciclopedia Treccani]*

rompigoccia s. m. - il rompigoccia è un elemento che permette di evitare il ristagno dell'acqua piovana: se utilizzato evita i segni dovuti allo scorrimento dell'acqua migliorando l'impatto estetico della copertura e della facciata.

rompitratta s.f. – Opera di puntellamento provvisoria, costituita da un elemento orizzontale (di legno o metallico) sostenuto da ritti e disposto sulla mezzeria o ai terzi medi della luce di un solaio o di altra struttura portante orizzontale per ridurre le sollecitazioni nella fase di costruzione, quando le strutture stesse non sono ancora complete e quindi non hanno raggiunto la resistenza totale. *[Enciclopedia Treccani]*

rurale agg. [dal lat. tardo ruralis, der. di rus ruris «campagna»]. – Che è della campagna, che ha relazione con la campagna in genere (spesso in contrapp. a urbano): l'ambiente r.; popolazione r., i contadini (indicati talora anche con il sost. pl. i rurali, meno com. al sing., un rurale); le massaie r. di un tempo (v. massaia); cassa r., società cooperativa di credito fra piccoli agricoltori; edilizia r., che riguarda le case coloniche e i varî edifici per il ricovero del bestiame, delle macchine agricole e dei prodotti; medicina r., relativa alle popolazioni agricole; economia r., l'economia privata dell'impresa agraria. *[Enciclopedia Treccani]*

rùstico agg. e s. m. [dal lat. rustĭcus, der. di rus «campagna»] (pl. m. -ci). – 1. agg. Di campagna, campagnolo: le r. zampogne (T. Tasso); casa r., fondo r.; chiesetta r.; lingua r., non com., la lingua parlata in campagna, dai contadini: que' componimenti e quelle stanze in lingua r. fiorentina e toscana, che ... ho vedute in gran credito, pregiandosi i primi verseggiatori di scrivere con lo stile de' montanari e de' bifolchi toscani, come d'un ornamento vezzoso di poesia (Bettinelli). Architettura r. , propria degli edifici sorti in tutti i tempi storici nelle campagne o nei piccoli centri abitati, edifici dovuti non all'opera

di artisti, di tecnici, di artefici dotati di una particolare cultura, ma all'estro costruttivo degli uomini della terra, contadini, operai, montanari; distinta quindi dall'architettura rurale, che comprende gli edifici costruiti sì in campagna, ma da tecnici colti e in base a progetti bene organizzati, per i bisogni dell'agricoltura e delle industrie agricole, oltreché per la razionale abitazione dei contadini. In titoli di opere e in denominazioni partic.: Il comune r., titolo di una poesia delle Rime nuove di G. Carducci (1885); La vita r., titolo di un'ode del Parini; stile r., di oggetti d'arredamento, mobili, costruzioni che ripetono nella foggia quelli diffusi in ambienti campagnoli: letto, tinello, villetta di stile r. (o anche tinello r., villetta r., ecc.); pizza r., torta r., pizza o pasticcio cotti al forno, con imbottitura di formaggio piccante o di carne salata, e condimento a base di pepe e altri aromi forti.
2. agg. Rozzo, molto semplice, non elegante: la rozza voce e r. in convenevole e cittadina ridusse (Boccaccio); una cena, una festa, una cerimonia r., semplice, alla buona, come si usa in campagna. Riferito a oggetti lavorati, non rifinito, grezzo: tavolo r., sedia r.; spec. di parti di costruzioni edilizie: muro r., facciata r., senza intonaco, senza rivestimento murario (e v. anche al n. 5 c): diede un'occhiata anche alla facciata del duomo, rustica allora in gran parte e ben lontana dal compimento (Manzoni); per l'intonaco r., v. intonaco. In partic.: a. Nella terminologia architettonica derivata dai trattati cinquecenteschi sugli ordini classici, si dicono rustiche le parti costituite da elementi bugnati, sia che si tratti di membrature appartenenti a un ordine architettonico, che prende il nome di ordine r., sia che il bugnato costituisca il motivo di paramento di tutta una superficie muraria e delle sue eventuali aperture; ancor più specificamente, si parla di bugnato r. quando gli elementi bugnati presentano una superficie scabra, grezza, irregolare, e non liscia: il bugnato r. adottato da Bernini per gli angoli del palazzo di Montecitorio. b. In legatoria, legatura r. o alla rustica (o brochure), con una semplice copertina di cartone o di carta pesante, effettuata per lo più nella tipografia stessa in cui il libro è stato stampato. c. Scrittura r., in paleografia e in epigrafia latina, forma di scrittura a tratteggiamento meno calligrafico e monumentale rispetto alla «elegante», senza essere però di esecuzione rozza e trascurata; in partic., nell'antichità classica e nel medioevo, scrittura r. (contrapp. a capitale elegante), tipizzazione della scrittura capitale libraria (v. capitale1, n. 3). 3. agg. fig. Ruvido, scontroso, poco socievole, soprattutto nei modi esteriori (in genere con senso non spreg. o meno spreg. di rozzo, ritroso): un uomo r., gente r.; è r., ma d'animo gentile; è così r. che accetta raramente i nostri inviti; r. schiettezza, semplicità, onestà; più raram., schivo, timido: se talora Vedea guatarmi da cupido amante, Chinava gli occhi rustica e selvaggia (T. Tasso). 4. agg. In agronomia, piante r., quelle capaci di adattarsi o di resistere a condizioni sfavorevoli climatiche (siccità, freddo, ecc.), pedologiche (carenza di nutrimenti o eccesso di sali), all'attacco di parassiti, ecc. 5. s. m. a. non com. Contadino, persona di campagna: anche se vive in città, è rimasto un r.; una festa di rustici. b. Il locale o il complesso dei locali che in una fattoria o in una villa sono adibiti alla rimessa di attrezzi agricoli o all'alloggio dei contadini, dei giardinieri, ecc.: ristrutturare un r. per farne una trattoria di campagna, o una villetta. c. Nel linguaggio tecn. delle costruzioni, r. di un edificio, il complesso delle sue strutture (ossatura portante e murature) prive di rivestimento e delle altre opere di finitura superficiale (spesso intenzionalmente non rifinite per creare un particolare effetto architettonico o ornamentale). d. In gastronomia, involtino di pasta sfoglia con ripieno di formaggio, funghi, alici e altri ingredienti saporiti. ♦ Dim. rustichétto; per lo più sostantivati l'accr. rusticóne, il pegg. rusticàccio o rusticonàccio, sempre nel sign. 3 e spesso con intonazione scherz. o affettuosa: ci rese a mala pena il saluto, quel rusticone (De Amicis). ♦ Avv. rusticaménte, in modo rustico: mobili lavorati rusticamente; anche, con schiettezza ruvida: trattare, salutare rusticamente. *[Enciclopedia Treccani]*

smaltare v. tr. [der. di smalto]. – 1. Ricoprire, rivestire di smalto; decorare a smalto: far s. un piattino di rame. *[Enciclopedia Treccani]*

stillicidio s.m. (pl. -di) 1 Caduta continua e lenta dell'acqua goccia a goccia: lo s. della grondaia || DIR Servitù di stillicidio, diritto di far cadere sul fondo del vicino l'acqua piovana che scende dal proprio tetto. 2 fig. Il ripetersi continuo, insistente e logorante di qualcosa di fastidioso o dannoso: una relazione interrotta da uno s. di domande; uno s. di allusioni, di recriminazioni. *[Dizionario La Repubblica]*

struttura portante - per struttura portante di un edificio si intende l'insieme degli elementi strutturali (travi, pilastri, fondazioni, ecc.) atti a sostenere i carichi agenti (pesi propri degli elementi, carichi verticali, carichi orizzontali, ecc.) in modo che l'edificio stesso possa essere utilizzato garantendo le prestazioni attese e il livello di sicurezza previsto dalle norme vigenti. Si definiscono come non strutturali gli elementi non in grado o non deputati a svolgere tali compiti: si pensi ad esempio ad elementi di tamponamento o tramezzatura leggeri, ai materiali isolanti, ai materiali di rivestimento e finitura, ecc.

tavèlla s. f. [lat. tabĕlla «tavoletta» (dim. di tabŭla «tavola»)]. – Laterizio forato di piccolo spessore (3-4 cm) usato soprattutto per solai e per controsoffitti, ma anche per la chiusura di piccoli vani con paretine sottili. *[Enciclopedia Treccani]*

travétto s. m. [dim. di trave]. – trave di piccole dimensioni. In partic., ognuno dei singoli elementi resistenti di cui sono costituiti molti tipi di solaio di cemento armato, o di cemento armato e laterizio, di uso corrente nella tecnica. *[Enciclopedia Treccani]*

vano agg. e s. m. [lat. vanus, agg., con i varî sign. dell'agg. ital.]. – Spazio definito risultante dalla suddivisione dell'interno di un edificio (sinon. di stanza, ambiente, locale): appartamento di sei v. con doppî servizî; il costo è di centomila euro a vano (nella compravendita di appartamenti, qualora essa avvenga per numero di vani anziché per numero di metri quadrati di superficie, gli accessorî, costituiti da cucina, corridoi, ingresso, bagno, ecc., vengono considerati frazioni di vano, in proporzione alla loro importanza e ampiezza). In edilizia, v. abitabile, ambiente provvisto dei requisiti necessarî per essere usato come abitazione, ossia di sufficiente cubatura, aerazione, illuminazione diurna, ecc., secondo quanto prescritto dai regolamenti edilizî. *[Enciclopedia Treccani]*

volte a botte s.f. – È uno tra i sistemi più semplici e diffusi di copertura non piana, tipica dell'architettura mediterranea, utilizzata per coprire spazi più o meno ampi, di forma genericamente rettangolare, evitando l'uso di manufatti in legname come travi, correnti, tavole. La volta a botte, che rientra nella grande categoria delle volte semplici (costituite cioè da superfici appartenenti ad un unico solido, a differenza delle volte complesse, costituite da superfici appartenenti a corpi solidi diversi), è un elemento tridimensionale, ottenuto geometricamente, dallo sviluppo di una superficie nello spazio, più precisamente dalla traslazione o rotazione di una curva direttrice (profilo dell'arco) lungo una retta generatrice. La volta a botte, quindi, deriva dall'arco, che è una struttura bidimensionale: in sostanza, l'unione di più archi nel senso dello spessore (definito "generatrice") dà luogo alla volta. In linea generale la volta a botte, che rientra nelle superfici coniche, nasce, come tutte le strutture voltate, per coprire edifici con struttura portante in muratura o pietra, e pertanto essa stessa ne assume il medesimo impianto strutturale. Non dividendosi in campate (spazio tra due o più elementi portanti di una struttura), la volta a botte non ha la necessità di avere un rapporto contenuto tra lunghezza e larghezza, ma può estendersi teoricamente all'infinito in lunghezza (o profondità) data una certa apertura (campo o luce). *[Enciclopedia Wikipedia]*