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Sustainability reporting and public value: Evidence from port authorities

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ABSTRACT

Due to the growing importance of Port Authorities (PAs) in pursuing economic, social, and environmental goals, scholars and policymakers should understand how these PAs can contribute to creating public value. By adopting the strategic triangle framework of public value, we studied how Italian PAs create public value by investigating their non-financial disclosures. For this purpose, we performed a cluster analysis and a lexical correspondence analysis on the textual content of the sustainability reports of eight Italian PAs. The study results allowed us to understand how PAs preserve and disseminate public value, obtain legitimacy and support from stakeholders, and build operational capacity.

1. Introduction

One of the biggest challenges for international policymakers is promoting and disseminating sustainable economic systems worldwide (Sachs et al., 2022). Considering this challenge, in 2015, the United Nations approved the 2030 Agenda for Sustainable Development, defining 17 Sustainable Development Goals (SDGs). Currently, SDGs face significant challenges, such as sustainable economic growth, social inequality, pollution, and climate change (United Nations General Assembly, 2015).

According to Bebbington and Unerman (2020), a greater focus on particular kinds of organizations is needed to advance the research in accounting to enable the SDGs achievement. Indeed, selecting relevant organizations to achieve the SDGs is not a standard accounting mode of research. The selection should depend on how organizations could affect the natural and social environment (Bebbington and Unerman, 2020). In this context, public utilities can be grouped among those organizations requiring extensive research efforts because they contribute considerably to economic development, which is more in line with social needs and respect for the environment while creating, preserving, and disseminating public value for the benefit of communities. In particular, Port Authorities (PAs) are public utilities that address various economic, environmental, and social issues (Di Vaio et al., 2019) and have the potential to contribute to achieving the SDGs significantly (Di Vaio et al., 2021). In this regard, as stated by Bebbington and Unerman (2020), some organizations play more significant roles than others in addressing the SDGs. In fact, SDGs (such as SDG 9, 'build resilient infrastructure, promote inclusive and sustainable industrialization, and foster

innovation') are intrinsically embedded within specific organizations' operations. In particular, organizations operating infrastructure could be relevant realities to consider to advance research (Bebbington and Unerman, 2020).

Furthermore, Bebbington and Unerman (2018) suggested that considering the complexity of defining entity boundaries with respect to nowadays hyperconnected and complex challenges such as those represented by the SDGs, these problems cannot be coped with in isolation. However, current accounting research often focuses on an individual, organizational scale. According to them, it is necessary to question the suitability of entities for accounting research. In this respect, Bebbington and Unerman (2018) mentioned SDG 11 ('sustainable cities and communities') and SDG 9 ('innovation and infrastructure'), which focus on entities that are not usually addressed by accounting research and could represent valuable sites for empirical investigations. Based on these suggestions, we posit that advancing research in PAs is relevant for accounting research to address SDGs. Undoubtedly, PAs can be seen as single entities and systems of different entities (i.e., the several ports managed), necessitating coordination to achieve mutual economic, social, and environmental results. PAs are responsible for coordinating port operations and services, workplace safety, and maintenance of the port area. They also administer several seaports and the maritime state property included in their jurisdiction. They provide services of general interest to citizens and coordinate port logistics systems, managing the port infrastructures. Moreover, the nature of PAs is generally hybrid, containing elements of both public and private law (Verhoeven, 2010). Concerning the Italian context, the PAs disclose the Energy and Environmental Planning Document based on guidelines provided by the

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Italian government (ENEL & Legambiente, 2022). In this regard, scholars (e.g., Caliskan, 2022) have stated that an important target to be achieved is to direct the attention of the sustainability disclosure of European ports to the SDGs.

Recently, academics have been paying more attention to the sustainability of ports, especially studying the impacts of port activities on the marine environment (Acciaro et al., 2014; Chang, 2013; Di Vaio et al., 2019). The term 'green port' is now referred to as a port that voluntarily includes respect for the environment and explicitly prevents and reduces the environmental impact of its activities beyond the mandatory legal constraints (Acciaro, 2015). Green ports pursue sustainability policies and practices balancing economic, social, and environmental dimensions. This approach to sustainability is called the 'triple bottom line' (Elkington, 1998) and can guide these utilities to achieve SDGs.

Since the rapid economic, social, technological, environmental, and institutional changes have affected the port sector in recent years (Laxe et al., 2021), PAs are now called upon to define strategies to face new scenarios in which the balancing of economic, social and environmental objectives has become critical. For this reason, sustainability policies and practices have gained increasing importance among PAs in recent years. Nevertheless, despite a significant increase in studies that have focused on sustainability in the port sector (Acciaro, 2015; Acciaro et al., 2014; Dinwoodie et al., 2012; Hiranandani, 2014; Langenus and Dooms, 2018; Roh et al., 2016), the topic of sustainability reporting in PAs is still underinvestigated (Geerts et al., 2021; Geerts and Dooms, 2020; Ruiz-Lozano et al., 2022; Santos et al., 2016). Previous studies have focused on particular aspects of PAs' sustainability reports, for example, quality (de Vicente-Lama et al., 2021). In this regard, scholars (Ashrafi et al., 2019; de Vicente-Lama et al., 2021; Geerts and Dooms, 2020; Grewal and Darlow, 2007) revealed that inadequate levels of quality and transparency in sustainability reporting of PAs could depend on the lack of a framework specifically developed for the PA sector. Geerts et al. (2021) addressed the disclosures' determinants of PAs in promoting sustainability report practice. Further studies (Geerts and Dooms, 2020; Grewal and Darlow, 2007) analyzed standardized approaches and applied frameworks to sustainability reporting of PAs. However, given the few studies on this topic, the research field on PA sustainability reporting appears scarce and fragmented. In particular, we noted the absence of studies focused on the sustainability reports of the Italian PAs, which have only recently adopted the practice of disclosing sustainability reports. Furthermore, no work has used the public value framework (Benington and Moore, 2011; Moore, 1995) to study how PAs can create public value by analyzing their sustainability reports.

In light of this premise, the current work answers the following research questions: What are the main themes that the Italian PAs disclose through their sustainability reports? How do Italian PAs preserve and disseminate public value? How do they get legitimacy and support from stakeholders? How do they build operational capacity? By answering these research questions, we aim to disclose how PAs create public value for communities by analyzing their sustainability reports. The originality of this work relies on adding to this literature empirical evidence on the thematic structure of PAs' sustainability reports to shed light on how these utilities perceive, conceive, and represent their role in the creation of public value.

We collected secondary data from eight Italian PAs and analyzed and processed the textual content of the sustainability reports published by these PAs by adopting a methodology based on cluster analysis and lexical correspondence analysis (Lebart and Salem, 1988). In particular, we used the T-Lab software (Lancia, 2019). Our results allow us to identify four main emerging thematic clusters: 'risk management,' 'infrastructural development,' 'sustainable thinking,' and 'transparency.' Since sustainability research plays a significant role for policymakers (Bebington and Unerman, 2018), we address our findings' theoretical and practical implications.

Four main reasons justify the focus of this study on the PA sector.

First, PAs' activities significantly impact economic development, as they can boost trade, shipping, and tourism (European Commission, 2022). Second, the impact of their activities on society and communities is remarkable because the seaports of the European Union offer around 2.5 million jobs (European Parliamentary Research Service, 2020). Third, operational port activities have significant environmental impacts, especially energy and water consumption, sea and air pollution, and waste management (European Commission, 2022). Finally, the Italian port system is among the most important port systems in Europe; it has one of the longest coastlines, 16 PAs manage 57 local ports, more than 12,000 shipping companies are involved, and Italy is the first country in Europe and the Mediterranean for Short Sea Shipping (Italian Ports Association, 2022).

Concerning the structure of this research article, the following section provides a review of the literature on sustainability reporting in public utilities and PAs. The third section introduces the theoretical framework adopted to develop the present study. The research context and methodology are described in section 4. Section 5 shows the results, while 6 discusses the research findings. Finally, Section 7 concludes the study by discussing implications and limitations and then suggests venues for future research.

2. Literature review

2.1. Sustainability reporting in public utilities

Public utilities are public or private organizations that provide specific products or services to the communities, such as natural gas, electric energy, water, waste disposal, and transportation (McNabb, 2005). These utilities are affected by public interest. Public utilities also provide sewage services (Rivenbark et al., 2017). In this regard, the scientific debate on utilities has often focused on water utilities (Antunes and Martins, 2020; Neto and Camkin, 2020). Since the public interest influences public utilities, communicating non-financial information to stakeholders through sustainability reporting becomes essential for them.

Academics defines non-financial information as complementary to financial one but not expressed in financial terms. The term 'non-financial information' can refer to a variety of subjects, including Corporate Social Responsibility (CSR), Environmental, Social, and Governance (ESG), sustainability, and others (Tarquinio and Posadas, 2020). However, there is evidence that this term is increasingly being understood to include data on corporate sustainability, CSR performance, society, and the environment (Tarquinio and Posadas, 2020). Entities convey this type of information through a sustainability report. On this subject, the literature has studied the possible factors that drive organizations towards sustainability reporting, for example, size (Brammer and Pavelin, 2006), industry (Fifka, 2013), profitability (Clarkson et al., 2011), and corporate governance mechanisms (Amran et al., 2014; Michelon and Parbonetti, 2012).

Among others, legitimacy theory can also explain the tendency toward sustainability disclosure of public utilities. According to this theory, organizations carry out sustainability reporting to fulfill their commitments to society (Chelli et al., 2014). From this perspective, public utilities disclose non-financial information to provide answers to environmental pressures (Miras-Rodríguez and Di Pietra, 2018). In doing so, public utilities adapt their non-financial disclosure according to the process of interpreting external demands (Vinnari and Laine, 2013), and sustainability reporting is conceived as a way to gain and maintain legitimacy and reputation (Deegan, 2014). Sustainability reporting is also a way to obtain legitimation by hybrid organizations, i. e., utilities controlled by public entities that provide goods or services to citizens (Christensen, 2017). As stated by Maine et al. (2022), sustainability strategies allow hybrid organizations to deal with the expectations of their internal and external stakeholders. Since hybrid organizations are subject to institutional pressures (Venturelli et al.,

2019) and engage with diverse stakeholder groups such as local communities, employees, non-governmental organizations, media, investors, customers, and suppliers (Tang et al., 2018), they gain legitimacy by adopting various disclosure tools (Nicolo et al., 2021). Indeed, it has been observed that the decline of sustainability reporting practices in public utilities may occur due to the lack of external pressure (Vinnari and Laine, 2013). However, their pivotal role in providing public interest services and complex hybrid nature makes these organizations particularly subject to the pressures of sustainability and have a substantial impact on their ESG corporate reporting practices, such as sustainability and SDGs reporting (Grossi et al., 2022). Additionally, Grossi et al. (2022) state that considering the impact of public spending on infrastructure is crucial for developing sustainable cities. According to various authors (Argento et al., 2019; Maine et al., 2022; Maran and Lowe, 2022; Stafford and Stapleton, 2022), in-depth research is needed on these hybrid organizations' roles and how they use, design, and implement their sustainability and SDGs' reporting.

Another driver that has recently influenced the attitude toward non-financial disclosure of public utilities is the regulatory context, which implies that organizations disclose mandatory information in compliance with national and international rules. In the European context, Directive 2014/95/EU establishes the request for non-financial disclosure for Public Interest Entities (PIEs). Under this European Directive, the PIEs (including several public utilities) are called to disclose environmental and social information concerning their activities (Caputo et al., 2021). According to Directive 2014/56/EU, PIEs are 'undertakings that are of significant public relevance because of the nature of their business, their size or the number of their employees'. The Directive aims to lead these entities to provide information to clarify their impacts on society and the environmental system, which then results in orienting them toward a sustainable path. However, the influence of the regulatory environment does not always affect the attitude of public utilities toward non-financial reporting. Specifically, a study by Ligorio et al. (2022), which analyzes the sustainability reports of three municipally owned enterprises, reveals that the logic of the market drives their disclosure policy rather than the normative context.

Previous studies on public utilities (Mio, 2010) have also focused on the issue of the quality of sustainability reporting. In this regard, the practice of disclosing information that is not only financial has also been strongly influenced by the issuing of international frameworks, including, above all, that of the Global Reporting Initiative (GRI), which defines a common framework of standards to regulate voluntary sustainability reporting to improve its quality and comparability (Costa and Valenza, 2017). For this reason, many organizations have adopted voluntary environmental and social reporting practices (Daub, 2007; Venturelli et al., 2022), including public utilities (Ligorio et al., 2022). Nonetheless, the results and effectiveness of adopting the GRI framework by public utilities are questionable. For example, Moseñe et al. (2013), through qualitative research on seven Spanish wind energy utilities, found that they use the GRI standards for the sake of form without significant improvements in the type or quality of the information disclosed. In particular, the motivations that drive public utilities towards voluntary sustainability reporting are still controversial. Some scholars (Vinnari and Laine, 2013), focusing on five municipal water utilities, found that fad and fashion explain the initial spread of sustainability reporting practice. Consistent with this study, Moseñe et al. (2013) found a mimetic aptitude of smaller public utilities to copy the sustainability reporting practice of larger ones. Mio (2010), analyzing the sustainability reports of 12 multi-utility Italian listed companies, found that the Corporate Social Responsibility (CSR) strategy positively influences the quality of those reports' content. Furthermore, the quality of the sustainability reports

also depends on three variables: the organizational complexity, the territorial extension, and the number of employees (Mio, 2010). Other studies have questioned the quality of sustainability reporting by public utilities. For instance, Slacik and Greiling (2020), focusing on the GRI sustainability reports of 489 energy utilities, found inappropriate use of reports as a means of communicating with stakeholders as these reports underrepresent the social aspects of reporting. Additionally, Dragomir (2012), through a study of the sustainability reports of the top five oil and gas companies in Europe, concludes that these public utilities have partially failed to disclose high-quality non-financial information. This study supports the criticism that the sustainability reporting practice of public utilities often has the purpose of greenwashing rather than real transparency (Dragomir, 2012).

Several scholars (e.g., Lock and Seele, 2016) have questioned the credibility of sustainability reports since they have been considered non-transparent, functional to attempts at greenwashing, and instrumental in improving the image of organizations. In this regard, Miras-Rodríguez and Di Pietra (2018) analyzed 176 CSR reports of listed energy companies and concluded that public utilities might need the insurance report from independent insurance companies to increase the credibility of their sustainability reports and to legitimize themselves to their stakeholders. Furthermore, Paolone et al. (2021), using action research and system dynamics in a multi-utility company, identified the main steps to develop sustainability reports to holistically consider the economic, social, and environmental dimensions functional to improve transparency and accountability.

2.2. Port authorities, sustainability, and sustainability reporting

The maritime sector significantly impacts the economy, commerce, environment, and society because it consists of multiple sub-sectors, including shipping, port operators, port authorities, maritime service providers, suppliers, and logistics (Karagiannis et al., 2022). Since the maritime sector is a gateway for national and international trade, it stimulates interaction with many local, national, and international stakeholders (Hiranandani, 2014). However, this sector can have adverse effects on society and the environment. For example, port activities can produce negative social impacts and counterproductive environmental consequences both at sea and on land (Dinwoodie et al., 2012; Klopott, 2013). Hou and Geerlings (2016) have stated that seaport activities can negatively affect sustainability's economic, social, and environmental dimensions. For instance, Quintano et al. (2021), through a comparative analysis of European ports' eco-efficiency, concluded that they cause air pollution and traffic congestion despite the positive economic impacts on regional areas.

For these reasons, seaports have come under pressure to adopt a holistic approach capable of balancing economic objectives with those of sustainability (Lozano et al., 2019). As a result, seaports have adopted corporate sustainability practices such as sustainability reporting (Ashrafi et al., 2019), providing information about pollution, protection of biodiversity, strategies for more efficient energy consumption, waste management, health and safety for employees (Drobetz et al., 2014).

Santos et al. (2016) analyzed the online sustainability reporting of European ports and found that larger ports show higher levels of non-financial information disclosed. Moreover, EcoPorts show higher levels of sustainability communication in the extent of disclosure and completeness. Finally, they suggest that sustainability reporting strongly depends on the port's national institutional context (Santos et al., 2016).

In recent years, PAs have supported initiatives to achieve greater sustainability in their activities, such as EcoPorts (European Sea Ports Organisation, 2021) or the Green Marine initiative (Green Marine,

2022).¹ As a result, PAs have also started to pay more attention to sustainability reporting. The determinants that push the PAs towards sustainability reporting can be considerable. For example, Geerts et al. (2021) found proximity to a city, history of performance data gathering, and amount of obtained social/environmental certifications to be significant organizational determinants of PAs in initiating sustainability reporting. Concerning the external determinants, the same authors found that the pressures of the institutional context influence the decision-making of PAs in adopting sustainability reporting.

Among the international initiatives, GRI (Global Reporting Initiative, 2022) is the one organization that promotes the homogenization of integrated sustainability reports by regulating the reporting of the economic, environmental, and social results entities. Despite an increasing number of PAs adopting the GRI framework, the quality and transparency of their sustainability reports remain questionable. According to Geerts and Dooms (2020), the lack of a sustainability reporting framework explicitly dedicated to PAs is the cause of inadequate levels of transparency regarding the sustainability performance of PAs. Scholars (Geerts et al., 2021; Grewal and Darlow, 2007) point out that the GRI guidelines are not ideally suited to the context of PAs in light of their unique and particular characteristics. In this regard, a sustainability reporting framework (i.e., a sectoral guide) that is specifically designed and developed for the PA sector could be the solution to the problems of inadequate levels of transparency and quality (Ashrafi et al., 2019, de Vicente-Lama et al., 2021; Geerts and Dooms, 2020; Grewal and Darlow, 2007).

However, the effects of adopting sectoral guides on the quality of PAs' sustainability reports have been questioned. For example, de Vicente-Lama et al. (2021) analyzed sustainability reports of Spanish PAs and found that sectoral guides influence the level of information disclosed while not affecting the quality and transparency of the same information. Instead, higher-quality sustainability reports are related to PAs disclosing information on stakeholder identification mechanisms and channels for their participation (de Vicente-Lama et al., 2021). Furthermore, better quality information is perceived in more extended reports and by larger PAs, as they have more resources to invest in sustainability reporting (de Vicente-Lama et al., 2021). By analyzing the sustainability reports of Spanish state-owned PAs, Ruiz-Lozano et al. (2022) found that disclosure of information about the materiality assessment process improves not only the amount of information on material issues but also the quality and credibility of sustainability reporting. In particular, as stated by Geerts and Dooms (2020), the materiality analysis in sustainability reporting plays a significant role in addressing the needs and expectations of various stakeholder groups by PAs.

Despite these studies, the scientific debate centered on the

¹ The primary environmental program for the European port industry is EcoPorts, which started in 1997 thanks to the proactive action of a group of forward-thinking ports. This initiative has been completely integrated into the European Sea Ports Organization (ESPO) since 2011. The guiding premise of EcoPorts aims to level the playing field in terms of the environment by encouraging collaboration and knowledge sharing across ports. EcoPorts offers its members two trusted resources: the Self Diagnosis Method (SDM), which helps members identify environmental risks, compare their scores to the European average, receive personalized recommendations from experts, and the Port Environmental Review System certificate (<https://www.ecoport.com>). The Green Marine initiative, which includes ship owners, ports, terminals, shipyards, and Canadian and American Seaway businesses as participants, is an open and inclusive movement. Participants must complete the certification process to become certified as Green Marine. Associations, supporters, and partners are also included in the membership, and they all help participants in different ways as they work to lessen their environmental impact. In order to establish Green Marine Europe in 2020, Green Marine worked with Surfrider Foundation Europe to export the environmental certification program to France in 2019 (<https://green-marine.org>).

sustainability reporting of PAs is still scarce and fragmented. Sustainability reporting in PAs is a niche that only recently developed since non-financial reporting is not common practice among maritime organizations and port operators (Karagiannis et al., 2022). Additionally, no study focusing on sustainability reporting in PAs has yet used the theoretical framework of the strategic triangle of public value (Moore, 1995). The present research, focusing on the context of the Italian PAs, studies how they create public value through the analysis of their sustainability reports. For this reason, the following section addresses the description of the theoretical framework adopted for the development of this research.

3. Theoretical framework: the strategic triangle of public value

As stated by Di Vaio et al. (2019), PAs are public utilities that address diverse economic, environmental, and social issues, providing services of public interest to various stakeholder groups. Since PAs satisfy public needs, stakeholders are interested in the public value created for their benefit. Moreover, PAs can leverage sustainability reports to acquire and maintain legitimacy as they adopt certain behaviors in line with stakeholder expectations (Acciaro, 2015). Therefore, sustainability reports represent the ideal basis for analyzing public value creation by PAs.

Benington (2011) defines public value as 'what adds value to the public sphere.' This definition incorporates the idea that public entities, public utilities, and public managers should take a more positive and proactive role in creating public value through strategic thinking, innovation, and entrepreneurial actions (Benington and Moore, 2011; Cave and Wright, 2021).

In this respect, Moore (1995) proposed a theoretical framework called the 'Strategic Triangle' in which public entities create public value through three interconnected and distinct processes: defining public value outcomes, obtaining stakeholder legitimacy, and building operational capacity (Fig. 1).

Public entities and utilities should develop the three pillars in synergy to create public value (Moore and Khagram, 2004). First, entities must define the strategic objectives and public value outcomes to achieve. Second, entities must obtain support and legitimacy from stakeholders in order to create a functional authorizing environment to achieve those goals and outcomes. Support must be obtained from public, private, and third-sector stakeholders and must not be limited to political support alone. Third, entities must build operational capacity by obtaining financial, human, technological, material, and infrastructural resources to achieve the defined objectives and outcomes (Benington and Moore, 2011).

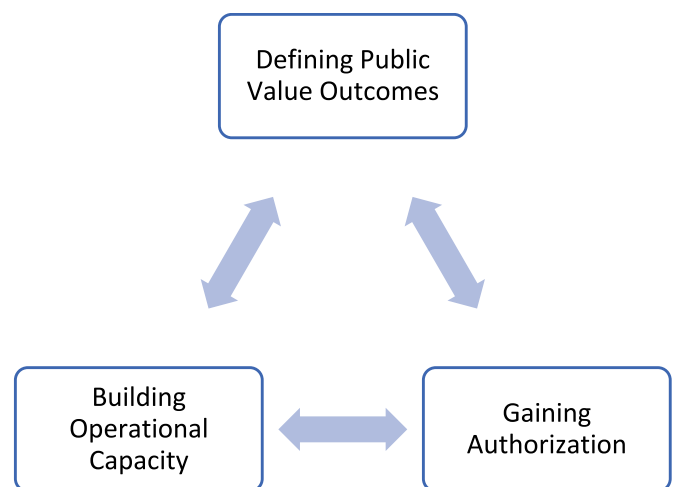


Fig. 1. The Strategic Triangle of public value. Source: Authors' elaboration from Benington and Moore (2011).

According to these three pillars, this research work aims to study three aspects of Italian PAs: how they preserve and disseminate public value, gain legitimacy and support from stakeholders, and build operational capacity. Using the Strategic Triangle framework, we study how Italian PAs create public value through the analysis of their sustainability reports (see Table 1).

4. Method

4.1. Research context

The maritime sector is particularly relevant to the Italian economy, and its role is pivotal in the European context. Italy has a coastline of 7600 km in length, i.e., the second longest coastline in the European Union and one of the top twenty coastlines in the world (Castellano et al., 2020). According to Eurostat online dataset, Italy has been in the top three European countries regarding the gross weight of goods handled in the last four years. Moreover, Messina and Reggio Calabria ports were the two largest European Union passenger ports in 2020 and 2021.² AssoPorti (i.e., Italian Ports Association) highlights that Italy has another primacy in the European port context. Indeed, the European Union has been mainly focused on developing sustainable alternatives to land transport, such as ‘motorways of the sea’ and ‘short-sea shipping.’ Specifically, in the White Paper ‘European transport policy for 2010: Time to Decide’ (European Commission, 2001), the European Commission proposed to develop new and strongly connected maritime-based logistics chains in the European areas to furnish a viable alternative to land transport in order to improve and make more sustainable the European transport system. In this regard, Italy is the first country in Europe and the Mediterranean for goods transported by short sea shipping, significantly reducing road traffic pollution (Italian Ports Association, 2022).

Based on the above-mentioned observations, the importance of the role played by the Italian port sector in achieving economic and sustainability goals at a global level is evident. However, managing such a complex and broad system of ports has required several efforts in regulation, harmonization, and planning. Certainly, the Italian PAs have experienced essential reforms which have substantially modified their governance, management, and organization in the last decades. Law 84 of 1994 (‘Reorganization of Port Legislation’) represents the first attempt at a comprehensive reform of the Italian port system in recent times. This reform established 18 PAs, increasing to 24 in the early 2000s, and they were responsible for the strategic planning and monitoring of port activities while giving private firms the task of managing terminals and commercial operations through authorizations and administrative licenses. Overall, the reform led to the modernization

and increased efficiency of the Italian port system by prompting domestic and international investments, allowing access to the market of private terminal operators, and improving port labor (Parola et al., 2017). Nevertheless, the reform’s limitations related to the strategic role of public authorities have become evident over time. Public authorities were afterwards requested to implement the development of port areas through long-term investments and the involvement of commercial concessionaires. The newly created PAs have demonstrated not being proactive enough in this respect. In actuality, the reform neglected landside development in favor of mainly focusing on the marine side by not fully addressing the claims of significant stakeholders regarding infrastructural needs, Information Technology solutions, and others (Parola et al., 2017).

After this law, in 2016, the Italian government promoted another substantial reform of the port system by adopting the legislative decree 169, approved on August 4, 2016 (‘Reorganization, Rationalization, and Simplification of the Discipline concerning the Port Authorities’). This reform reorganized Italian ports into ‘port systems’. Each port system aggregates several ports, taking into consideration various aggregation criteria, including the characteristics of the port, port history, the port area’s political influences, and the hinterland’s peculiarities (Parola et al., 2017). After this reform, 16 ‘port authorities’ replaced the previous 24. Table 2 shows the current list of Italian PAs.

Compared to the past, a port system authority assumes a more significant role in planning strategic objectives and managing operations for the ports located in its area of responsibility (Ferretti et al., 2018). In this scenario, the Italian PAs are called upon to define their sustainability strategies more markedly. For example, “the planning of the port system must respect the criteria of energy and environmental sustainability [...]. To this end, the port system authorities promote the drafting of the energy and environmental planning document of the port system to pursue adequate objectives, with particular reference to the reduction of CO2 emissions” (article 4-bis of the legislative decree 169/2016).

Consequently, Italian PAs are now called to be an active part of achieving sustainable goals. On this subject, parts of these authorities have recently started to produce their first sustainability reports. These reports have been provided for the first time in the context of the Italian PA sector and should account for how PAs perceive sustainable strategy and performance. Therefore, these reports provide valuable insights for researchers to understand how PAs perceive and fulfill their sustainable players’ role.

In this regard, the context of the Italian PAs represents an emblematic case to study for research on sustainability.

4.2. Research design and data collection

The sample of our analysis consists of the sustainability reports of eight out of sixteen Italian PAs because only eight Italian PAs disclose non-financial information through sustainability reports (data accessed on November 3, 2022). We excluded those PAs that did not disclose a sustainability report when we accessed the data. Therefore, we have selected the first, most recent, and available sustainability reports for each PA that discloses non-financial information. We have adopted a research protocol for sustainability reports based on the analysis of the contents of the PA websites. In particular, we analyzed the sections of the websites dedicated to sustainability, environmental protection, relations with stakeholders, and reporting. To avoid the potential bias of not found or missing documents, we have corroborated our search results by searching for PA sustainability documents using search engines (i.e., Google). The methodology used in this paper is consistent with previous studies (Pizzi et al., 2020) and mitigates the risks of non-identification of documents due to the absence of a search protocol.

Table 3 shows the list of Italian PAs that publish the sustainability report, the type of report and publication date, the number of pages, and the framework/standard adopted.

Table 1
Theoretical framework and research purposes.

Theoretical Framework	Pillars	Research Purposes
Strategic Triangle of Public Value	Defining public value outcomes	Understand how port authorities preserve and disseminate public value
	Gaining authorization	Understand how port authorities gain legitimacy and support from stakeholders
	Building operational capacity	Understand how port authorities build operational capacity

Source: Authors’ elaboration

² Data can be consulted in the Eurostat online dataset: https://ec.europa.eu/eurostat/databrowser/explore/all/all_themes.

Table 2

Italian port authorities and connected ports.

	Denomination	Region	Main port	Other connected ports
1	PA of the Western Ligurian Sea	Liguria	Genoa	Prà, Savona, Vado Ligure
2	PA of the Eastern Ligurian Sea	Liguria	La Spezia	Marina di Carrara
3	PA of the Northern Tyrrhenian Sea	Tuscany	Leghorn	Capraia, Piombino, Rio Marina, Portoferraio, Cavo
4	PA of the Central-Northern Tyrrhenian Sea	Lazio	Civitavecchia	Fiumicino, Gaeta
5	PA of the Central Tyrrhenian Sea	Campania	Naples	Castellammare di Stabia, Salerno
6	PA of the Sardinian Sea	Sardinia	Cagliari	Olbia, Golfo Aranci, Porto Torres, Oristano, Portovesme, Santa Teresa Gallura
7	PA of the Western Sicilian Sea	Sicily	Palermo	Termini Imerese, Porto Empedocle, Trapani
8	PA of the Eastern Sicilian Sea	Sicily	Augusta	Catania
9	PA of the Strait of Messina	Sicily	Messina	Milazzo
10	PA of the Southern Tyrrhenian and Ionian Seas	Calabria	Gioia Tauro	Corigliano, Crotona, Palmi
11	PA of the Ionian Sea	Apulia	Taranto	None
12	PA of the Central Adriatic Sea	Marche	Ancona	Falconara, Pescara, Pesaro, San Benedetto del Tronto, Ortona
13	PA of the Central-Northern Adriatic Sea	Emilia-Romagna	Ravenna	None
14	PA of the Southern Adriatic Sea	Apulia	Bari	Brindisi, Manfredonia, Barletta, Monopoli
15	PA of the Eastern Adriatic Sea	Friuli-Venezia Giulia	Trieste	None
16	PA of the Northern Adriatic Sea	Veneto	Venice	Chioggia

Source: Authors' elaboration (Data retrieved from <https://www.assoporti.it/it/autoritastemportuale/adsp/>)

We downloaded sustainability reports from the official website of each PA in PDF format. While six of eight reports were already in a readable format, two were composed of scanned images of the sustainability report's pages. We converted these two reports into TXT format using an OCR software named 'Tesseract' and the related Python module. After this step, we read the two reports and the OCR results to verify whether the last ones were consistent with the original texts or not. The OCR TXT presented some minimal typos that the authors have corrected.

4.3. Data analysis

After verifying the OCR-generated text with original reports, all the texts of the eight reports were uploaded to the software T-Lab to conduct textual analyses. T-Lab is a text analysis software that allows researchers to conduct a thematic analysis of texts using statistical and graphical tools (Lancia, 2019). The main advantage of performing this kind of textual analysis is obtaining simplified representations of the information embedded in the texts. Statistical techniques and tests support these simplified representations and allow the researchers to discover and interpret underlying patterns of meaning in the texts. The first step of the analysis is corpus cleaning. After removing all the stop words (i.e., words that have no particular meaning when isolated from the text), the remaining words have been lemmatized, and word compounding has

Table 3

List of Italian port authorities' sustainability reports.

	Denomination	Type of report	Pages	Framework/Standard
1	PA of the Eastern Ligurian Sea	Sustainability report 2018	59	GRI, SDGs
2	PA of the Central Tyrrhenian Sea	Sustainability report 2020	60	GRI, SDGs, GBS ^a
3	PA of the Sardinian Sea	Sustainability report 2021	82	GRI, SDGs
4	PA of the Strait of Messina	Sustainability report 2021	80	GRI, SDGs, International Association of Ports and Harbours, World Port Sustainability Program
5	PA of the Southern Tyrrhenian and Ionian Seas	Sustainability report 2021	75	GRI, SDGs
6	PA of the Ionian Sea	Sustainability report 2021	112	GRI, SDGs, OECD ('Guidelines for Multinational Enterprises), ISO 26000, UN Human Rights ('Protect, Respect and Remedy' Framework)
7	PA of the Central-Northern Adriatic Sea	Sustainability report 2021	114	GRI, SDGs
8	PA of the Southern Adriatic Sea	Sustainability report 2020	75	GRI, SDGs, GBS

Source: Authors' elaboration (Data accessed on November 3, 2022).

^a Italian acronym for 'Gruppo di Studio per il Bilancio Sociale' (Study Group for the Social Report) (<http://www.gruppobilanciasociale.org>).

been performed. Overall, the total corpus for the analysis is composed of 13,301 words (types), 181,439 occurrences (tokens), and 4711 elementary contexts. Elementary contexts are comparable length pieces of text composed of one or more sentences that T-Lab identifies as sequences of words interrupted by full stops, carriage returns, punctuation marks, or using statistical criteria (Lancia, 2019).

The first textual analysis we performed was the thematic analysis of elementary contexts (Lancia, 2019), which allowed us to identify a few thematic clusters representing most information in the analyzed texts. Each cluster is composed of elementary contexts sharing similar words' co-occurrences. In particular, the analysis has been performed using a bisecting k-means algorithm (Savaresi and Boley, 2001; Steinbach et al., 2000) on a contingency table of elementary contexts per word. Additionally, we selected the parameters that maximized the information explained by the clusters (bisecting clustering and three co-occurrences per elementary context).

As we proceeded to the second step of our analysis, we performed the lexical correspondence analysis on the contingency table, having lemmas as rows and clusters as columns. The lexical correspondence analysis (Lebart and Salem, 1988) is an explorative statistical method allowing the reduction of high-dimensionality data into fewer dimensions by losing just a tiny part of the original information (Greenacre, 1984; Lebart et al., 1984; McEwan and Schlich, 1991; Quarchioni et al., 2021). The reduction of dimensionality offers the analyst a clearer comprehension of the analyzed dataset leading to an intuitive interpretation.

Lexical correspondence analysis is used on high-dimensionality contingency tables, having rows as all the words in the analyzed texts and columns as all the documents or thematic areas (clusters) where those words are present. We used this technique on the contingency table, having rows as the words present in the analyzed texts and columns as the thematic clusters identified by the bisecting k-means algorithm. Concerning this large contingency table, it is possible to search for differences in the presence and distribution of the words in the different documents or thematic areas. However, it is not easy for humans to look directly at the contingency tables in searching for differences in the distribution of words in different documents or thematic

areas. Therefore, lexical correspondence analysis helps create a factorial space where the axes are combinations of the original dimensions (rows and columns), and the words and thematic areas are points in this factorial space. Looking at this visual representation, called biplot (Gabriel, 1971), it is possible to notice correlations among words and clusters. In particular, words and clusters far from the origin of the axes and close to each other are highly correlated, while words and clusters far from the origin of the axes and far from each other are negatively correlated.

Moreover, as the two dimensions, or axes, created by the lexical correspondence analysis are combinations of the original dimensions (the words and the identified clusters in the texts), it is possible to interpret them. In this regard, each word and cluster contribute to creating the two dimensions with a value called ‘contribution to inertia.’ A higher contribution to inertia means that a particular word or cluster is significant in interpreting that dimension. Interpreting these axes allows for identifying the latent meaning in the analyzed texts (Quarchioni et al., 2021). In this respect, the factorial space generated by lexical correspondence analysis allowed us to interpret the clusters’ relationship and identify the investigated reports’ underlying semantic and meaning structure. The following section describes the results of these two analyses.

5. Results

The first analysis allowed us to locate the topics in PAs’ sustainability reports. Our bisecting k-means analysis allowed us to classify 97.71% of the total amount of elementary contexts in the text (4603 out of 4711). Table 4 shows the percentages of elementary contexts for each cluster.

Therefore, we found four main themes in sustainability reports using bisecting k-means clustering. According to their contents, we labeled them ‘risk management’ (cluster 1), ‘infrastructural development’ (cluster 2), ‘sustainable thinking’ (cluster 3), and ‘transparency’ (cluster 4).

5.1. Risk management cluster

The first theme we located is characterized by lemmas such as ‘security,’ ‘safety,’ ‘work,’ ‘health,’ ‘authorization,’ ‘accident,’ and ‘control’ (see Table 5 in the Appendix). This theme is related to the prevention of several types of potential damage. Some of the most representative elementary contexts of this theme are mentioned below:

“The PSA guarantees its employees safe and healthy working conditions and is also committed to preventing accidents and occupational diseases that may occur during the course of their work” (PA of the Sardinian Sea sustainability report, p. 50).

“Employee training is also a preventive measure against the risk of corruption. The PA periodically administers adequate in-house training in the areas of anti-corruption and transparency, both to assist in monitoring and to disseminate the values of ethics and transparency at work” (PA of the Strait of Messina sustainability report, p. 63).

“The Authority proposes to the Port Security Authority the name of the Port Security Officer from among its own personnel, and the Security Authority, by its own act, appoints him. Following the Port Facility Security Assessment conducted by the Authority and approved by the Port

Authority, the individual Terminal Security Officers shall draw up the Security Plan for their respective port facility, in accordance with Regulation 725/2004, and send it to the Security Committee for approval” (PA of the Central-Northern Adriatic Sea sustainability report, p. 56).

“The Authority is committed to enhancing cyber risk prevention by drafting an Information Security Plan and conducting a cyber risk self-assessment, including the risk matrix and aimed at assessing network and information system security, including security policy documents” (PA of the Southern Tyrrhenian and Ionian Seas sustainability report, p. 38).

“The PSA, with regard to safety in the workplace for all its employees, in order to reduce the number and severity of accidents, prepares and updates the risk assessment on the occasion of any substantial organizational and operational change” (PA of the Central Tyrrhenian Sea sustainability report, p. 34).

These elementary contexts represent the willingness of the PAs to prevent damage to their workers (in terms of safety and health), operativity, and computer systems. Considering the aforementioned elementary contexts, we labeled this cluster ‘risk management.’

5.2. Infrastructural development cluster

The second theme is characterized by lemmas such as ‘port,’ ‘logistic,’ ‘goods,’ ‘sea,’ ‘transport,’ ‘realization,’ and ‘terminal’ (see Table 6 in the Appendix). The most representative elementary contexts of this theme are the following:

“In 2020, the Port Authority presented an initial project (the executive project is underway) for the construction in the Port of Bari of the passenger terminal quay 10, which will be developed over an area of about 3,000 square meters, for a total planned amount of about €10 million financed by the Apulia Region and by the Authority’s own funds” (PA of the Southern Adriatic Sea sustainability report, p. 47).

“This intervention also envisages the construction of energy production systems from renewable sources: two photovoltaic plants (one at the Port of Bari and the other at the Port of Brindisi) connected to the cold ironing plants in order to meet, in part, the energy needs of the ships moored at the quay” (PA of the Southern Adriatic Sea sustainability report, p. 50).

“During the two-year period 2020 and 2021, the Authority’s activities aimed at optimizing port services, supporting an incisive improvement in the efficiency of the physical infrastructure, and resolving critical environmental, socio-economic and urban redevelopment situations, including those concerning the hinge area between the port and the city, have been further strengthened” (PA of the Ionian Sea sustainability report, p. 17).

“The overall objective of the project is to improve the connection between the port of Marina and Carrara and the related road and rail transport networks. The financing, once obtained, will cover part of the costs for the works to upgrade the multimodal access system to the port and the maritime works necessary to secure them” (PA of the Eastern Ligurian Sea sustainability report, p. 19).

According to these elementary contexts, this cluster is strongly related to the description, optimization, and empowerment of ports’ infrastructures. Therefore, we labeled it ‘infrastructural development.’

5.3. Sustainable thinking cluster

The third theme we located is characterized by lemmas such as ‘energetic,’ ‘emission,’ ‘consumption,’ ‘environmental,’ ‘sustainability,’ ‘distribution,’ and ‘stakeholder’ (see Table 7 in the Appendix). The most representative elementary contexts of this theme are the following:

Table 4
Percentage of elementary contexts classified in the four clusters.

Cluster	Percentage of elementary contexts
1. Risk management	23.5%
2. Infrastructural development	28.9%
3. Sustainable thinking	24.4%
4. Transparency	23.3%

Source: Authors’ elaboration from T-Lab software

“The sustainability report, realized for the first time by the Port Transit Authority, can show points on which to reflect on the better focus to become the start point of a really more sustainable social and environmental policy” (PA of the Eastern Ligurian Sea sustainability report, p. 4).

“Below are the five SDGs and their main targets for the organization that will guide the narrative and discussion of the topics within the document. SDG ‘decent work and economic growth: fostering lasting, inclusive and sustainable economic growth, full and productive employment and decent work for all’” (PA of the Sardinian Sea sustainability report, p. 8).

“The actions carried out by the Port Authority were also reclassified for the 17 Global Goals (the Sustainable Development Goals) to be pursued by UN member states by 2030” (PA of the Central Tyrrhenian Sea sustainability report, p. 5).

“These elements have prompted the Authority to implement a policy aimed at launching new commercial and logistical activities and rethinking the port areas with the objective of extending the range of services and activities already existing, as well as generating positive spin-offs for the area, both in economic and employment terms and in environmental, social and cultural terms” (PA of the Ionian Sea sustainability report, p. 63).

“The process of logistical and economic development, as well as the increasing use of the sea as a communication and transport route, must be accompanied by a minimization of the impact that related activities generate on the environment and people. In recent years, we are witnessing an increased awareness of sustainability issues” (PA of the Sardinian Sea sustainability report, p. 21).

Considering the aforementioned elementary contexts, we labeled this cluster ‘sustainable thinking.’

5.4. Transparency cluster

The last theme we located is characterized by lemmas such as ‘disclosure,’ ‘GRI,’ ‘woman,’ ‘man,’ ‘corruption,’ ‘anticorruption,’ ‘director,’ ‘secretary,’ ‘training,’ and ‘transparency’ (see Table 8 in the Appendix). The most representative elementary contexts of this theme are mentioned below:

“This materiality analysis has been conducted following the approach outlined in the Global Reporting Initiative’s international framework” (PA of the Strait of Messina sustainability report, pp. 18–19).

“The Authority’s governance system is geared towards ensuring that the management of the Authority and the ports it manages is not only in line with compliance, but, above all, effective and efficient in terms of processes, fostering transparency towards its stakeholders” (PA of the Sardinian Sea sustainability report, p. 28).

“The ‘Code of Behavior for employees,’ annexed to the Anti-Corruption and Transparency Plan, is the tool that defines the behaviors that the Authority’s employees are required to observe in order to ensure the quality of services” (PA of the Southern Tyrrhenian and Ionian Seas sustainability report, p. 8).

“The year 2021 saw the reappointment of President [name and surname 1] and the reconstitution of the Management Committee and the Board of Auditors. The new composition of the Bodies is shown below. At the beginning of 2022, Rear Admiral [name and surname 2] took over from Rear Admiral [name and surname 3]” (PA of the Ionian Sea sustainability report, p. 50).

“The General Secretary and the Executives shall make a declaration of the non-existence of causes of ineligibility and incompatibility for assuming offices in public administrations and private bodies in public control. This declaration is published on the website in the ‘Transparent Administration’ section, under the sub-section ‘Organization - Holders of political,

administrative, the management or government offices - Secretary General’ for the Secretary General and under the sub-section ‘Personnel - Holders of executive offices’ for the Executives” (PA of the Southern Adriatic Sea sustainability report, p. 40).

“100% of staff receive annual performance appraisals, according to criteria weighted differently according to contractual classification” (PA of the Strait of Messina sustainability report, p. 59).

Considering the aforementioned elementary contexts, we labeled this cluster ‘transparency.’

5.5. Lexical correspondence analysis biplot

We obtained three dimensions explaining all the information in the texts by performing lexical correspondence analysis. For visual clarity, we used the biplot plotting the first two dimensions (x and y-axis). These two dimensions explain more than 73% of the information in the texts.

The results of the lexical correspondence analysis are shown in Fig. 2.

We analyzed each axis’s contribution to inertia values to make sense of the representation. The contribution to inertia value is the extent to which each point in the map (word or cluster) has contributed to creating the axis.

Specifically, the highest levels of contribution to inertia to the x-axis (see Table 9 in the Appendix) are given by cluster 4 (transparency) and by words such as ‘employee,’ ‘disclosure,’ ‘worker,’ ‘management,’ ‘corruption,’ ‘transparency,’ ‘assessment,’ and ‘accountable.’ In contrast, the lowest contribution to inertia to the x-axis is given by cluster 2 (infrastructural development) and words such as ‘port,’ ‘project,’ ‘logistic,’ ‘realization,’ and ‘works.’ Therefore, this axis seems to show a semantic opposition between ‘operational capacity’ (and its development) and ‘gaining authorization’ through transparent communication.

With respect to the second axis, the highest contribution to inertia (see Table 10 in the Appendix) is given by cluster 1 (risk management) and words such as ‘security,’ ‘job,’ ‘authorization,’ ‘verification,’ ‘risk,’ ‘emergency,’ and ‘computer’ while the lowest contribution is given by the cluster 3 (sustainable thinking) and words such as ‘energetic,’ ‘emission,’ ‘sustainability,’ ‘distribution,’ ‘stakeholder,’ and ‘social.’ In this respect, this axis seems to show a semantic opposition between the ‘preservation of public value’ through risk management procedures and the ‘distribution of public value’ through the search for increased efficiency in electricity generation, a reduction of environmental impacts, and the distribution of economic and social value to the stakeholders.

6. Discussion

Sustainability reporting does not necessarily imply actual sustainability results (Bebbington and Unerman, 2018), as it is a cognitive tool, and its content depends on the level of transparency and reliability. Hence, greater transparency on sustainability issues makes it possible to contribute to sustainable development through more significant interaction with stakeholders (Venturelli et al., 2022). Furthermore, sustainability reporting is particularly relevant when public utilities must be sustainable but are also called upon to encourage other subjects to do so (Ruiz-Lozano et al., 2022), as in the case of PAs and the ports they manage and administer (Verhoeven, 2010). As Bebbington and Unerman (2020) suggested, we selected a particular type of organization that can significantly influence the natural and social environment. In light of the relevant economic, social, and environmental impacts they cause (Di Vaio et al., 2019), PAs can have a pivotal role in achieving SDGs (Di Vaio et al., 2021). From this perspective, our study wants to advance research on accounting for sustainability, according to the call of Bebbington and Unerman (2020). In particular, our results indicate that PAs are among those organizations mainly focused on operating infrastructure to innovate and make them sustainable (SDG 9) and contribute to realizing more sustainable cities and communities (SDG 11). Since

transparency are characterized by a very similar percentage, between 23.3% and 24.4%. Therefore, these three topics are of equal importance in sustainability reporting. On the other hand, the infrastructural development cluster has a higher percentage of elementary contexts (almost 29%), meaning that the infrastructural development theme has greater weight, occupying more space in the reports than the other three themes. This observation is particularly significant since the analysis was conducted on sustainability reports. Indeed, we expected greater importance of the theme of sustainable thinking or transparency. The Italian PAs, therefore, aim to pursue sustainability objectives by giving greater importance to infrastructural interventions to improve the efficiency and quality of transport, logistics, and multimodal networks, increase energy efficiency, and exploit the production of energy from renewable resources. In turn, infrastructural interventions play a pivotal role in developing sustainable cities and communities (Grossi et al., 2022). This finding reinforces our commitment to investing more attention in research on this kind of public utility due to the statement of Bebbington and Unerman (2020) regarding the need for a greater focus by accounting research on organizations operating infrastructure for the achievement of SDGs (in particular SDG 9).

Interesting insights came from the sustainable thinking cluster. We chose PAs' first-year sustainability reports to investigate how they are coping with this kind of reporting for the first time. In this regard, sustainability reports are managerial tools also useful for decision-making purposes, capable of generating a managerial understanding of organizations' role in coping with sustainability issues (Geerts and Doms, 2020). Sentences highlighted in this cluster provide evidence about this process (e.g., *"the sustainability report, realized for the first time by the Port Transit Authority, can show points on which to reflect on the better focus to become the start point of a really more sustainable social and environmental policy"* (PA of the Eastern Ligurian Sea sustainability report, p. 4).

Another insight we found regards employee-related lemmas (such as 'employee' and 'worker'). It was impossible to locate a specific cluster addressing employee-related issues. Reporting about employees is just part of the clusters 'transparency' and 'risk management.' In this sense, PAs' sustainability reports appear to be more polarized in reporting about infrastructural development rather than human development. Additionally, most human-related disclosure regards employees' population descriptive statistics and little evidence related to developing their skills. Similarly, as shown by previous works regarding sustainability reporting in energy utilities (e.g., Slacik and Greiling, 2020), social aspects are, therefore, underrepresented in PAs' sustainability reports. In this respect, a credibility problem (Dragomir, 2012; Lock and Seele, 2016) could be raised concerning the sustainability reports of the Italian PAs. Therefore, PAs could adopt possible solutions deriving from the introduction of insurance reports from independent insurance companies to safeguard and improve the credibility, quality, and transparency of sustainability reports (Miras-Rodríguez and Di Pietra, 2018) or approaches that holistically consider the social, environmental, and economic dimensions (Paolone et al., 2021). Moreover, since GRI guidelines (adopted by the eight PAs) are not ideally designed for their peculiarities (Geerts et al., 2021; Grewal and Darlow, 2007), sectoral guides specifically proposed for PAs could be a solution for the lack of quality (Ashrafi et al., 2019, de Vicente-Lama et al., 2021; Geerts and Doms, 2020; Grewal and Darlow, 2007).

The four clusters are not equally spaced (see Fig. 2). A certain proximity can be seen between clusters 1 (risk management) and 4 (transparency) on the right side of the map. Since a cluster represents a set of co-occurring lemmas (i.e., lemmas that have a certain proximity in the texts of the sustainability reports), the proximity between clusters 1 and 4 means that the topics of risk management and transparency are conceptually close and, hence, connected. At a conceptual level, therefore, the Italian PAs treat the two themes in a connected way in their sustainability reports, implying that they see risk management tools as a way to increase and improve the level of transparency in favor of stakeholders. On the other hand, another proximity exists between

clusters 2 (infrastructural development) and 3 (sustainable thinking). At a conceptual level, the Italian PAs treat the two themes connectedly, implying that they see infrastructural interventions as the primary way to achieve greater economic, social, and environmental sustainability.

6.2. Sustainability reporting and public value

The other three research questions were derived from Moore's strategy triangle framework (Benington and Moore, 2011; Moore, 1995): how do Italian port authorities preserve and disseminate public value? How do they obtain legitimacy and support from stakeholders? How do they build operational capacity?

To answer these questions, we interpreted the contribution to the inertia of the lemmas in light of the theoretical framework of the strategic triangle of public value (see Fig. 1). The contribution to inertia represents the weight of the lemmas and clusters to interpret the graph's axes in Fig. 2. We found four concepts that allow us to interpret the axes. The concepts 'authorization' and 'operational capacity' characterize the x-axis and are connected to the second and third pillars of the strategic triangle. On the contrary, the y-axis includes two concepts connecting to the strategic triangle's first pillar: 'preserving public value' and 'distributing public value'.

On the y-axis, the 'risk management' cluster characterizes the concept of 'preserving public value'. In this regard, the content of this cluster allows us to answer the research question of how Italian PAs preserve public value. Therefore, risk management policies, such as healthy and safe working conditions, communication of ethical values, defining responsibilities, and prevention of cyber-attacks, can be seen in the PAs' sustainability reports as ways to preserve and protect public value. On the same axis, the 'sustainable thinking' cluster highlights the concept of 'distributing public value'. The thematic content of this cluster answers the research question of how Italian PAs distribute public value. From this perspective, interventions aimed at promoting sustainability (for example, definition of social and environmental policies, restoration and enhancement of port areas, and analysis of the contribution of activities to the SDGs) can be conceived by PAs as ways to disseminate and distribute public value to stakeholders.

The right side of the x-axis overlaps the 'transparency' cluster; thus, it seems to depict the concept of 'gaining authorization', meaning that PAs see transparency policies as ways to gain stakeholder support and legitimacy. In light of this, the concept of 'transparency' answers the research question of how PAs obtain legitimacy and support from stakeholders. Therefore, materiality analysis, processes and bodies to protect transparency, anti-corruption policies, and interventions for the dissemination of information externally via websites are conceived in the reports as tools to gain authorization. Obtaining authorization from stakeholders then enables PAs to achieve public value outcomes. This finding is in line with the legitimacy theory, according to which organizations rely on sustainability reporting to fulfill their commitments to society and the pressures from stakeholders (Chelli et al., 2014; Miras-Rodríguez and Di Pietra, 2018; Venturelli et al., 2019; Vinnari and Laine, 2013). From this point of view, the Italian PAs conceive sustainability reporting as a tool to obtain and maintain legitimacy and reputation (Deegan, 2014; Nicolo et al., 2021). In particular, this finding seems to corroborate the idea that the pressure of the institutional context is an external determinant that leads PAs to adopt sustainability reporting (Geerts et al., 2021).

The left side of the same axis overlaps with the 'infrastructural development' cluster. We can interpret it with the concept of 'building operational capacity' that answers the research question of how Italian PAs build operational capacity. Conceptually, the implication is that PAs leverage infrastructural interventions (e.g., the construction of passenger terminals, logistics infrastructure, multimodal links, and renewable energy production systems) to enhance their operational capacity, which enables PAs to achieve public value outcomes.

Fig. 3 highlights the multiple relationships between the themes

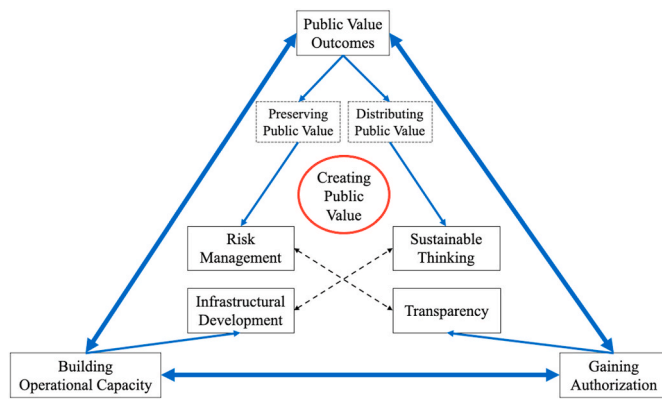


Fig. 3. Sustainability reporting of port authorities and public value creation. Source: Authors' elaboration

contained in the sustainability reports of Italian PAs and how they contribute to creating public value according to the strategic triangle of public value.

7. Conclusion

This paper has investigated how PAs contribute to creating public value according to their sustainability reports to produce new knowledge regarding the link between sustainability reporting and public value in the PA sector. On this subject, Ashrafi et al. (2019) state that despite the increasing prominence of the corporate sustainability debate over time, its role in the port industry has been limited. Therefore, we focused on sustainability reports since they are considered critical managerial tools in understanding organizations' role regarding sustainability issues (Geerts and Dooms, 2020). In particular, this is an explorative study that focuses on the Italian context, where PAs have only recently started producing sustainability reports. Focusing on such utilities allowed us to observe and comment on the first steps of Italian PAs in addressing, comprehending, and communicating their role as sustainability players.

According to our results, the generation of public value is highly embedded in the first sustainability reports of these utilities. By conducting textual analysis and using Moore's framework of public value (Moore, 1995), we have been able to interpret the content of PAs' sustainability reports. These reports focus on four different themes in communicating public value creation: 'risk management,' 'infrastructural development,' 'sustainable thinking,' and 'transparency.' We highlighted that these themes are highly related to the three pillars of the strategic triangle: 'defining and achieving public value outcomes,' 'building operational capacity,' and 'gaining authorization.' The concept of preserving public value is related to risk management practices, while, on the other hand, the distribution of public value relies on the sustainable thinking aptitude of PAs. Also, they build operational capacity mainly through interventions in infrastructural development. Finally, PAs leverage transparency practices to gain authorization and legitimacy from stakeholders. These four themes depict the underlying process of public value creation, according to Moore (1995).

Our work has several implications. Related to the theoretical ones, we shed light on the relationship between PAs' sustainability reports and the creation of public value as it was conceptualized by Moore (1995). This relationship is a solid theoretical insight regarding the role of sustainability reports as managerial tools to conceptualize PAs' sustainability role and strategy (Geerts and Dooms, 2020). Moreover, this paper aims to contribute to the literature on utilities and PAs' sustainability reporting by providing empirical evidence on these reports' thematic structure. Literature on sustainability reporting of PAs is still scarce, as highlighted by Karagiannis et al. (2022); thus, new evidence should be provided for this kind of utility. Moreover, apart from being

underdeveloped literature, previous studies have mainly analyzed PAs' sustainability reporting determinants (Geerts et al., 2021), quality (de Vicente-Lama et al., 2021), and standardized approaches and applied frameworks (Geerts and Dooms, 2020; Grewal and Darlow, 2007) while we have focused, in particular, on investigating the content of PAs' sustainability reports concerning the conceptualization and creation of public value. These insights could be helpful in the literature on sustainability reporting in PAs. Revealing that the underlying narrative of these particular utilities can be read with the strategic triangle sheds light on an interpretive approach to understanding PAs' active role in sustainable development. Furthermore, as in previous studies (e.g., Ashrafi et al., 2019), we provide insights into the perception of the port sector's utilities in addressing sustainability issues. However, in so doing, we still emphasize the criticalities of investigating this new phenomenon. Specifically, we highlighted that we need a better comprehension of how these peculiar actors perceive their roles.

Regarding the managerial implications, our empirical results allowed us to develop a framework (Fig. 3) that highlights how Italian PAs empirically apply the strategic framework theorized by Moore (1995). This framework can be helpful specifically for PA managers to conceptualize and report on their public value commitment. Another insight for managers, policymakers, and standard setters, is related to the distribution of the themes we found. According to our results, the infrastructural development theme is the most present theme in the sustainability reports. Therefore, in communicating their role as sustainable players, PAs tend to show how they improve and upgrade ports' infrastructures. Moreover, this topic is followed by the sustainable thinking theme; therefore, in communicating their role in enhancing ports' infrastructure, these utilities also show their efforts to provide increased energy efficiency and reduce environmental impacts. Nevertheless, it is surprising not to have located a theme strongly related to human capital development. Human capital seems to be just a component of the transparency and risk management themes. Human capital information mainly concerns employees' distribution, turnover, gender, and other statistics. Training activities' mainly regard human rights and workers' safety. It may be helpful to dedicate more effort in practice and space in the reports to activities to increase employees' skills.

Other implications of this study could be addressed directly by standard setters and policymakers. As highlighted by previous studies (Geerts et al., 2021; Geerts and Dooms, 2020; Grewal and Darlow, 2007), a framework for sustainability reporting explicitly dedicated to PAs is often missing. In this respect, most of these utilities rely on the GRI framework. However, researchers posit that this framework does not suit PAs well, leading to inadequate transparency and quality (Ashrafi et al., 2019; de Vicente-Lama et al., 2021; Geerts et al., 2021; Geerts and Dooms, 2020; Grewal and Darlow, 2007). Our sample corroborates this evidence. All the utilities in our sample rely on the GRI framework, and only one combines a sectorial reporting framework. Italian policymakers should try to prompt a greater adoption of sustainability reporting sectorial guidelines, and international standards could make more efforts to provide and diffuse guidelines in this respect. For example, Spanish PAs are provided with mandatory national sectorial guidelines to prepare their sustainability reports (de Vicente-Lama et al., 2021). These guidelines have been promulgated to overcome the adoption of a generic framework that could not meet the peculiar information needs of PAs' stakeholders (Ashrafi et al., 2019; Geerts et al., 2021; Geerts and Dooms, 2020; Grewal and Darlow, 2007). According to de Vicente-Lama et al. (2021), the sectoral guide has shown to be a helpful tool for encouraging information distribution and for tailoring the released information to the needs of stakeholders, also contributing to the comparability of information by offering a uniform response to the substantive challenges recognized in the industry. At the beginning of their PAs' sustainability reporting path, policymakers could take inspiration from the Spanish experience and guidelines instead of letting PAs rely solely on the GRI framework. The policymakers could also engage with PAs, organizations, and initiatives to understand their

sectoral specificity and promulgate mandatory disclosure guidelines. Other implications for policymakers concern the methodology we applied in this study since the techniques we adopted can be used to monitor the thematic content of PAs' sustainability reports. In particular, policymakers could use thematic and lexical correspondence analysis (Lebart and Salem, 1988) on sustainability reports to monitor how PAs longitudinally create and disseminate public value (Benington and Moore, 2011; Moore, 1995). Additionally, this analysis could be periodically repeated to understand how the dominant themes in the PAs' sustainability reports vary over time. Also, as more PAs begin to release their sustainability reports, this technique could detect if there are any missing or understated topics. Policymakers could consider the results of this monitoring to redefine the mandatory content of the future sectoral guide for a more effective standardization of the PAs' sustainability reports. Finally, policymakers could replicate this study on other public utilities and state-owned enterprises.

Lastly, regarding the limitations of this study, sustainability reporting in PAs is still not a common practice (Karagiannis et al., 2022). Therefore, it was not possible to gain a large sample of PAs to provide generalizable results about the themes included in their sustainability reports. Moreover, not all the Italian PAs have produced a sustainability report yet; therefore, our sample is even more limited. However, as we already stated, this is an explorative study. It is out of the scope of this work to provide generalizable conclusions. The main aim was to

understand the content of what is reported in PAs' sustainability reports considering their peculiarity as sustainability reporting issuers and as neo-adopters of this practice.

In this respect, future studies could further investigate the insights provided in this study by performing the same analysis in other national contexts and using larger samples. The same analysis could also be repeated using a longitudinal perspective. These further analyses could provide evidence about possible changes in the reported main themes over time and space. Such insights could also lead to new understanding and conceptualizations of public values in the PAs' field. The same analysis could also be conducted on PAs using different sustainability reporting standards (e.g., GRI and a sectorial one) to compare potential differences in the disclosed themes and obtain further insights on the necessity of adopting sectorial standards.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

Appendix

Table 5
The first 25 lemmas in cluster 1 (risk management)

Lemmas-Variables	Occurrences in Cluster	Total Occurrences	CHI ²	(p)
Security	302	368	692.75	0,000
Work	309	391	661.52	0,000
Health	178	196	487.06	0,000
Worker	178	215	414.10	0,000
Authorization	85	93	234.84	0,000
Operation	113	163	186.89	0,000
Company	124	189	182.83	0,000
Risk	96	129	182.77	0,000
Verification	73	87	173.70	0,000
Service	191	366	163.63	0,000
Measurement	126	209	154.05	0,000
To_authorize	49	52	142.47	0,000
Performance	76	112	120.20	0,000
Emergency	53	65	119.72	0,000
License	75	112	115.38	0,000
Supply	70	103	111.05	0,000
Computer	39	42	110.61	0,000
Injury	43	51	103.16	0,000
Accident	38	42	103.12	0,000
Control	78	127	99.39	0,000
Firm	32	33	97.56	0,000
Personal	34	37	94.74	0,000
Issuing	34	37	94.74	0,000
Prorogate	29	29	92.97	0,000
Procedure	91	163	92.53	0,000
Protection	47	63	89.84	0,000
Manage	272	708	84.40	0,000
Administrative	77	135	82.50	0,000
Application	36	44	81.81	0,000
Privacy	50	73	80.58	0,000

Source: Authors' elaboration from T-Lab software

Table 6
The first 25 lemmas in cluster 2 (infrastructural development)

Lemmas-Variables	Occurrences in Cluster	Total Occurrences	CHI ²	(p)
Port	612	820	883.77	0,000
Logistic	152	184	270.11	0,000
Goods	148	178	266.47	0,000
Works	151	184	264.75	0,000
Traffic	153	193	249.71	0,000
Project	168	228	234.09	0,000
Sea	221	342	225.52	0,000
Maritime	175	256	205.01	0,000
Transport	105	122	202.41	0,000
Railway	73	73	186.32	0,000
Passenger	91	103	184.59	0,000
Wharf	72	72	183.76	0,000
Quayside	122	161	180.70	0,000
Net	106	135	169.42	0,000
Realization	118	161	162.33	0,000
Terminal	81	93	159.79	0,000
Mediterranean	63	66	147.80	0,000
Spezia	85	106	141.95	0,000
Harbor	619	1475	141.31	0,000
System	362	769	137.12	0,000
Adriatic	93	124	134.61	0,000
Ravenna	108	161	120.72	0,000
Fund	61	70	120.42	0,000
Sector	123	198	113.08	0,000
Connection	63	77	109.64	0,000

Source: Authors' elaboration from T-Lab software

Table 7
The first 25 lemmas in cluster 3 (sustainable thinking)

Lemmas-Variables	Occurrences in Cluster	Total Occurrences	CHI ²	(p)
Energetic	212	268	441.11	0,000
Economic	269	414	376.38	0,000
Emission	177	230	349.35	0,000
Value	145	200	254.51	0,000
Consumption	113	137	253.70	0,000
Environmental	209	343	252.81	0,000
Development	212	383	203.08	0,000
To_generate	112	154	197.71	0,000
Distribute	77	89	188.32	0,000
Sustainability	233	451	185.96	0,000
Sustainable	134	207	185.50	0,000
Goal	202	377	177.78	0,000
Capital	55	60	148.77	0,000
Income	79	107	143.62	0,000
Financial	74	98	140.57	0,000
Current	45	46	135.82	0,000
Electric_energy	56	69	121.94	0,000
Account	61	79	120.95	0,000
Stakeholder	137	256	120.01	0,000
Social	102	171	117.13	0,000
DEASP	39	40	117.05	0,000
Result	70	103	107.46	0,000
Agenda	37	39	106.08	0,000
Impact	130	251	104.22	0,000
Efficiency	52	69	98.37	0,000

Source: Authors' elaboration from T-Lab software

Table 8
The first 25 lemmas in cluster 4 (transparency)

Lemmas-Variables	Occurrences in Cluster	Total Occurrences	CHI ²	(p)
Disclosure	250	307	563.55	0,000
GRI	241	320	469.30	0,000
Waste	260	375	429.94	0,000
Total	309	494	410.73	0,000
Woman	144	155	408.35	0,000
Employee	244	363	378.33	0,000
Office	137	156	352.73	0,000
General	171	228	329.96	0,000
President	154	197	321.42	0,000
Personnel	198	295	305.80	0,000
Page	159	226	270.37	0,000
Corruption	116	142	262.47	0,000
Director	99	112	257.66	0,000
Secretary	83	85	255.53	0,000
Man	71	73	217.13	0,000
Accountable	73	78	209.40	0,000
Committee	112	153	205.95	0,000
Chapt	68	71	202.72	0,000
Performance	112	157	195.68	0,000
Indicator	86	105	195.43	0,000
Reported	59	60	183.69	0,000
Evaluation	150	249	182.52	0,000
Management	321	708	182.17	0,000
Transparency	116	172	180.70	0,000
Training	139	231	168.66	0,000

Source: Authors' elaboration from T-Lab software

Table 9
Variables' contributions to the inertia of the x-axis

CAT	POLE (-)	CONTR	CAT	POLE (+)	CONTR
VAR	CL_02	-0.45	VAR	CL_04	0.46
LEM	Port (noun)	-0.02	LEM	Employee	0.01
LEM	Project	-0.01	LEM	Waste	0.01
LEM	Logistic	-0.01	LEM	Disclosure	0.01
LEM	Port (adjective)	-0.01	LEM	Management	0.01
LEM	Goods	-0.01	LEM	GRI	0.01
LEM	Works	-0.01	LEM	Worker	0.01
LEM	Traffic	-0.01	LEM	Woman	0.01
LEM	Realization	-0.01	LEM	Office	0.01
LEM	Transport	-0.01	LEM	Total	0.01
LEM	Quayside	0.00	LEM	Training	0.01
LEM	Passenger	0.00	LEM	General	0.01
LEM	Maritime	0.00	LEM	Corruption	0.01
LEM	Net	0.00	LEM	President	0.01
LEM	Sea	0.00	LEM	Director	0.01
LEM	Wharf	0.00	LEM	Transparency	0.01
LEM	Railway	0.00	LEM	Assessment	0.01
LEM	Terminal	0.00	LEM	Committee	0.01
LEM	Spezia	0.00	LEM	Secretary	0.01
LEM	System	0.00	LEM	Page	0.01
LEM	Mediterranean	0.00	LEM	Accountable	0.01
LEM	Taranto	0.00	LEM	Performance	0.00
LEM	City	0.00	LEM	Men	0.00
LEM	Seaside	0.00	LEM	Prevention	0.00
LEM	Millions	0.00	LEM	Indicator	0.00
LEM	Intervention	0.00	LEM	Chap	0.00
LEM	Fund	0.00	LEM	Anticorruption	0.00
LEM	Connection	0.00	LEM	Man	0.00
LEM	Ravenna	0.00	LEM	Reported	0.00
LEM	Sector	0.00	LEM	Pg	0.00
LEM	Adriatic	0.00	LEM	Auditor	0.00
LEM	Harbor	0.00	LEM	Government	0.00
LEM	Cruise	0.00	LEM	Age	0.00
LEM	Marine	0.00	LEM	Board	0.00
LEM	Centre	0.00	LEM	Number	0.00

Source: Authors' elaboration from T-Lab software

Table 10
Variables' contributions to the inertia of the y-axis

CAT	POLE (–)	CONTR	CAT	POLE (+)	CONTR
VAR	CL_03	–0.41	VAR	CL_01	0.50
LEM	Energetic	–0.01	LEM	Security	0.03
LEM	Emission	–0.01	LEM	Job	0.02
LEM	Economic	–0.01	LEM	Health	0.02
LEM	Sustainability	–0.01	LEM	Worker	0.02
LEM	Value	–0.01	LEM	Authorization	0.01
LEM	Goal	–0.01	LEM	Service	0.01
LEM	Consumption	–0.01	LEM	Operation	0.01
LEM	Sustainable	–0.01	LEM	Firms	0.01
LEM	Distribution	–0.01	LEM	Verification	0.01
LEM	Environmental	–0.01	LEM	Risk	0.01
LEM	Generate	–0.01	LEM	License	0.01
LEM	Develop	–0.01	LEM	To_authorize	0.01
LEM	Stakeholder	–0.01	LEM	Emergency	0.00
LEM	Financial	0.00	LEM	Supply	0.00
LEM	Capital	0.00	LEM	Computer	0.00
LEM	Budget	0.00	LEM	Accident	0.00
LEM	Current	0.00	LEM	Measurement	0.00
LEM	Strategy	0.00	LEM	Procedure	0.00
LEM	Result	0.00	LEM	Port (adjective)	0.00
LEM	Social	0.00	LEM	Area	0.00
LEM	Entry	0.00	LEM	Protection	0.00
LEM	Energy	0.00	LEM	Company	0.00
LEM	Electric energy	0.00	LEM	Injury	0.00
LEM	DEASP	0.00	LEM	Release	0.00
LEM	Account	0.00	LEM	Salerno	0.00
LEM	Impact	0.00	LEM	Extension	0.00
LEM	Agenda	0.00	LEM	Performance	0.00
LEM	GRI	0.00	LEM	Personal	0.00
LEM	Gas	0.00	LEM	Control	0.00
LEM	Disclosure	0.00	LEM	Insure	0.00
LEM	Materiality	0.00	LEM	Regulation	0.00
LEM	Total	0.00	LEM	Naples	0.00
LEM	Reporting	0.00	LEM	Administrative	0.00
LEM	Efficiency	0.00	LEM	Application	0.00

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