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Short Communication

The contribution of the European Society for Soil Conservation (ESSC) to scientific knowledge, education and sustainability



Carmelo Dazzi^{a,*}, Wim Cornelis^b, Edoardo A.C. Costantini^c, Mihail Dumitru^d, Michael A. Fullen^e, Donald Gabriels^f, Raimonds Kasparinskis^g, Adam Kertész^h, Giuseppe Lo Papa^a, Guenola Pérèsⁱ, Jane Rickson^j, José L. Rubio^k, Thomas Sholten^l, Sid Theocharopoulos^m, Ivan Vasenevⁿ

^a Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

^b Department of Environment, University of Ghent, Belgium

^c CREA-AA Research Centre for Agriculture and Environment, Firenze/Florence, Italy

^d Institute for Soil Science Agrochemistry & Environment Protection, ICPA Bucharest, Romania

^e Faculty of Science and Engineering, The University of Wolverhampton, WV1 1LY, UK

^f UNESCO Chair on Eremology, Faculty of Biosciences Engineering, Ghent University, Belgium

^g University of Latvia, Faculty of Geography and Earth Sciences, Riga, Latvia

^h Geographical Institute, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences, Budapest, Hungary

ⁱ UMR SAS INRA Agrocampus, 65 rue de Saint Brieuc, Rennes, France

^j Cranfield Soil and AgriFood Institute, Cranfield University, Cranfield, UK

^k IDE-CSIC Ctra. Moncada- Naquera km 4.5, 46113 Moncada, Valencia, Spain

^l Department of Geosciences, Soil Science and Geomorphology, University of Tübingen, Germany

^m Hao-Demeter, Institute of Soil and Water Resources, 14123 Athens, Greece

ⁿ Ecology Department, Russian State Agrarian University, Timiryazev Agricultural Academy, Moscow, Russia

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ABSTRACT

Soil is an integral component of the global environmental system which supports the quality and diversity of terrestrial life on Earth. Therefore, it is vital to consider the processes and impacts of soil degradation on society, especially on the provision of environmental goods and services, including food security and climate change mitigation and adaptation. Scientific societies devoted to soil science play significant roles in reducing soil degradation and promoting soil conservation by advancing scientific knowledge, education and environmental sustainability.

The ESSC was founded on 4 November 1988, with the aims to:

1. Support research on soil degradation, soil protection and soil and water conservation.
2. Provide a network for the exchange of knowledge about soil degradation processes and soil conservation research and practises.
3. Produce publications on major issues relating to soil degradation and soil and water conservation.
4. Advise regulators and policy-makers on soil issues, especially soil degradation, protection and conservation.

The societal challenges that can be addressed through better soil protection, advancing knowledge and scientific approaches to soil protection and sustainable management, mean the ESSC embraces the on-going development, application, review and constructive criticism of highly innovative scientific soil conservation methods. In this context, the ESSC analyses and publicizes the roles and functions of soil in natural and human-modified systems and the functional optimization of soils to ensure sustainable environmental protection.

"The thin layer of soil that forms a patchy covering over the continents controls our own existence and that of every other animal of the land" (Rachel Carson (1962) in *"Silent Spring"*).

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* Corresponding author.

E-mail address: carmelo.dazzi@unipa.it (C. Dazzi).

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1. Introduction

In Europe, changes in land-use and management and the introduction of new technologies that exploit finite land resources have increased soil degradation, including soil erosion (Chisci & Morgan, 1986; Dazzi & Costantini, 2008). These processes impair soil quality and the ability of soils to deliver vital ecosystem goods and services to society (Faber & van der Pol, 2006).

Mountainous areas have been deforested for many centuries (Hosonuma et al., 2012). Fire hazards, inadequate reforestation programmes, silvicultural mismanagement and increasing use of mountainous areas for recreation has often increased soil degradation, creating tremendous on-site and off-site problems (Pimentel et al., 1995). In hilly cultivated areas, crops and animal husbandry specialization, pervasive mechanization and large-scale intensive application of agrochemicals have instigated widespread hydrological problems, soil degradation and resultant pollution of water bodies (Novotny, 1999). In lowland Europe, crop specialization, field enlargement and abandonment of land reclamation structures and works, have increased runoff generation and resultant soil erosion. Moreover, large-scale mechanization and application of agrochemicals is leading to soil organic matter depletion, decreased soil biodiversity (including decreased micro-organism and micro-invertebrate populations), degradation of soil structure and pollution of ground- and surface-water (Hamza & Anderson, 2005).

2. The European Society for Soil Conservation

In response to growing concerns over soil conservation issues in Europe, on 3–4 November 1988, 18 experts from Belgium, Denmark, France, Germany, Greece, Italy, Portugal, Spain, the Netherlands and the United Kingdom met and founded the 'European Society for Soil Conservation' (ESSC) in Leuven (Belgium) on 4 November 1988 (Fig. 1). Launching the Society resulted from a general consciousness of soil degradation being a reality on our continent (De Ploey, 1989) and an awareness of the need for the development of effective soil conservation policies in Europe (Fig. 2). The meeting was convened by Professor Jan de Ploey, assisted by Dr Jean Poesen (both of KU Leuven). They invited active



Fig. 1. Group photo of people attending the foundation meeting of the ESSC in Leuven (Belgium), on 4 November 1988. The photo was taken at the entrance of the KU Leuven Faculty Club, where the founding meeting was held. The Report of the foundation was signed by: G. Chisci (Italy); M. Coutinho (Portugal); J. de Ploey (Belgium); A. Goncalves Ferreira (Portugal); D. Gabriels (Belgium); L. Hansen (Denmark); A.C. Imeson (the Netherlands); J.P. Lautridou (France); G. Monnier (France); R. Morgan (UK); N. Misopolinos (Greece); G. Richter (Germany); M. Rohdenburg (Germany); J.L. Rubio (Spain); M. Sala (Spain); U. Schwertmann (Germany); N. Silleos (Greece); J. Thorne (UK). Photograph by L. Cleeren.

researchers from across Europe to discuss the possible launch of a European group focused on soil conservation issues. The first ESSC President was Professor Jan de Ploey, with Professor Roy Morgan (Cranfield University, UK) and Professor Maria Sala (University of Barcelona) elected as Vice-Presidents and Professor Gerard Richter (Trier University, Germany) was elected as Secretary-Treasurer.

During the first year, the number of individual and institutional members increased to ~300 (De Ploey & Richter, 1992). After several years, the ESSC achieved over 500 members, peaking at 560 members. It is clear that increasing membership is one of the first indications of European support for the main aim of our Society, namely promoting soil conservation.

Over 30 years (1988–2018), the Society has made great strides and now constitutes an important international network of scholars from 47 countries. The ESSC works with institutions and individuals on soil and land conservation initiatives, and produces publications and documents of which we are very proud. Our current members represent interdisciplinary expertise. They are experts in various fields of fundamental and applied science and their application to soil conservation problems. They are teaching at universities, conducting investigations at scientific academies, promoting citizen awareness and citizen science regarding soil health, and working on applied issues at experimental stations and government institutions. Their fields of activity include: governmental administrations and similar institutions

REPORT OF THE FOUNDATION MEETING OF THE ESSC.

LEUVEN, NOVEMBER 3 AND 4, 1988

1. PRESENT FOUNDING MEMBERS : Chisci G.
Coutinho M.
De Ploey J.
Goncalves Ferreira A.
Gabriels D.
Hansen L.
Imeson A.
Lautridou J.P.
Monnier G.
Morgan R.
Misopolinos N.
Richter G.
Rohdenburg M.
Rubio J.
Sala M.
Schwertmann U.
Silleos N.
Thorne J.

2. CHAIRMAN : Prof. J. De Ploey

SECRETARY : Dr. J. Poesen

3. NAME : "European Society for Soil Conservation"

4. AIMS

The ESSC will be a multidisciplinary, non-political Society which is mainly dedicated to promoting the science and art of good land use in Europe. Emphasis is on the fields of soil degradation (soil erosion, physical, chemical and biological degradation and its consequences) and on soil conservation. The ESSC tries to integrate all parts that are involved in the above cited fields: research laboratories, governmental institutions, EEC, farmers and farmer unions, policy-makers and all those concerned with the implementation of these fields. The ESSC want also to play an educative role by informing the public about major soil conservation matters in Europe.

5. MAJOR ACTIVITIES

- a. support but not organize local meetings
- b. organize :
 1. thematic workshops
 2. expert advisory groups
 3. regional conferences on topics of subcontinental interest
 4. the general congress, every 4 years.
- c. Newsletter 14 languages, English, French, German and Spanish) 4 editions/yr. Editor-in-chief H.-R. Bork, Braunschweig, supported by the Council Members. The Newsletter brings news from the Society, national information, ... First issue March 1989. Deadline for manuscripts (1/2 to 1 p./country): January 1th, 1989.

Fig. 2. Page 1 of the Report of the foundation meeting of the ESSC, including Charter and aims of the Society.

(6%); environmental planning (4%); land and water management (6%); pedology (38%); forestry, biology and ecology (8%); hydrology and engineering (6%); agricultural sciences (11%); geography (13%), and geology, mineralogy and chemistry (8%) (Fig. 3). Some 52% of our members are scientists at scientific institutions and universities; 28% of our members work at government institutions; 16% are private individuals (hence, we do not have information about their profession) and 4% are private organizations and commercial enterprises (Fig. 4).

The ESSC held its First International Congress in Silsoe (England) in 1992. The success of the First Congress encouraged the ESSC to hold a programme of international congresses. The second International Congress was in Munich (Germany) in 1996; the third in Valencia (Spain) in 2000; the fourth in Budapest (Hungary) in 2004; the fifth in Palermo (Italy) in 2007; the sixth in Thessaloniki (Greece) in 2011; the seventh in Moscow (Russian Federation) in 2015 and the eighth in Lleida (Spain) in 2017 (Fig. 5). The next International Congress will be held in Tirana (Albania) in September 2019. In between the Congresses, the ESSC has organized several other international conferences on particular topics. The most recent were in 2016 in Cluj-Napoca (Romania) titled 'Soil: Our Common Future' and in 2017 in Riga (Latvia) titled 'Soil Classification: A Powerful Tool for Planning Soil Conservation.' The most recent conference was in 2018 in Imola (Italy) titled 'Soil and Water Security: Challenges for the Next 30 Years!'

2.1. The ESSC newsletter

From the beginning, we considered the regular production of a newsletter to be of paramount importance for the progress of the Society. The ESSC Newsletter is the communication tool between members, and it is the instrument to disseminate useful information and views. Their contents include concise but very valuable reports on matters of soil degradation and conservation in the different member countries; meeting and research reports. There are also announcements on workshops, conferences and congresses. Starting from Newsletter 2007(2), each issue of the ESSC Newsletter presents a 'Guest Editorial' as an opportunity for leading authorities in the soil science community to offer their perspectives on issues relating to soil conservation. Schweizerbart Science Publishers has kindly agreed to publish a book based on Guest Editorials that will form part of the international, peer-reviewed 'Advances in GeoEcology' series of Catena. ESSC Newsletters can be accessed at: <http://www.soilconservation.eu> (accessed 25/10/18).

Both the ESSC web-site and the ESSC Facebook page have free and open access:

<https://www.facebook.com/European-Society-for-Soil-Conservation-ESSC-100528363448094/>
(accessed 25/10/18).

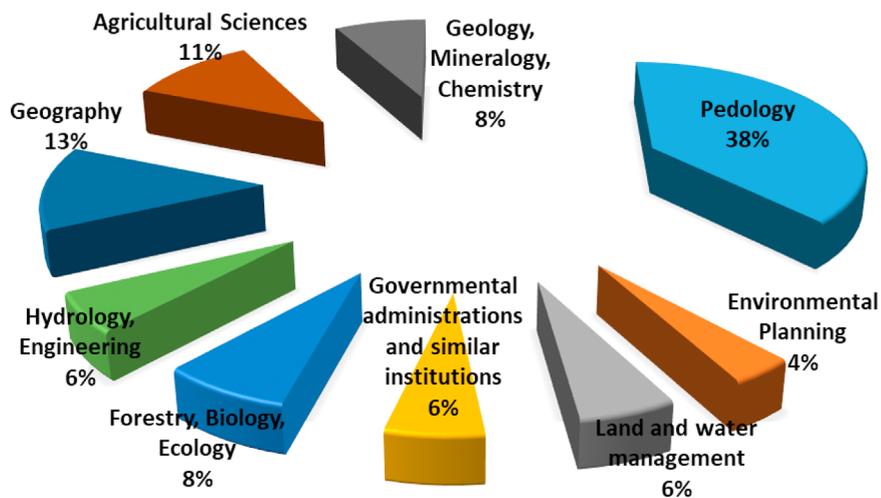


Fig. 3. ESSC members subdivided by activity.

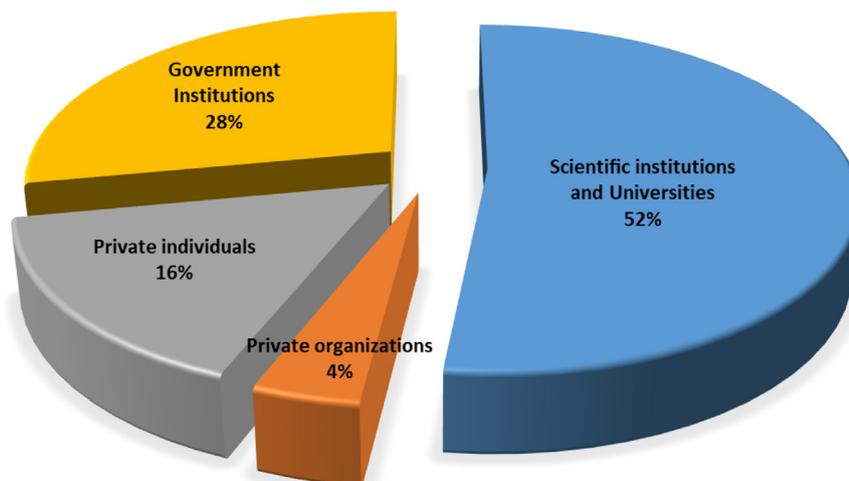


Fig. 4. ESSC members subdivided according to their institutional work.

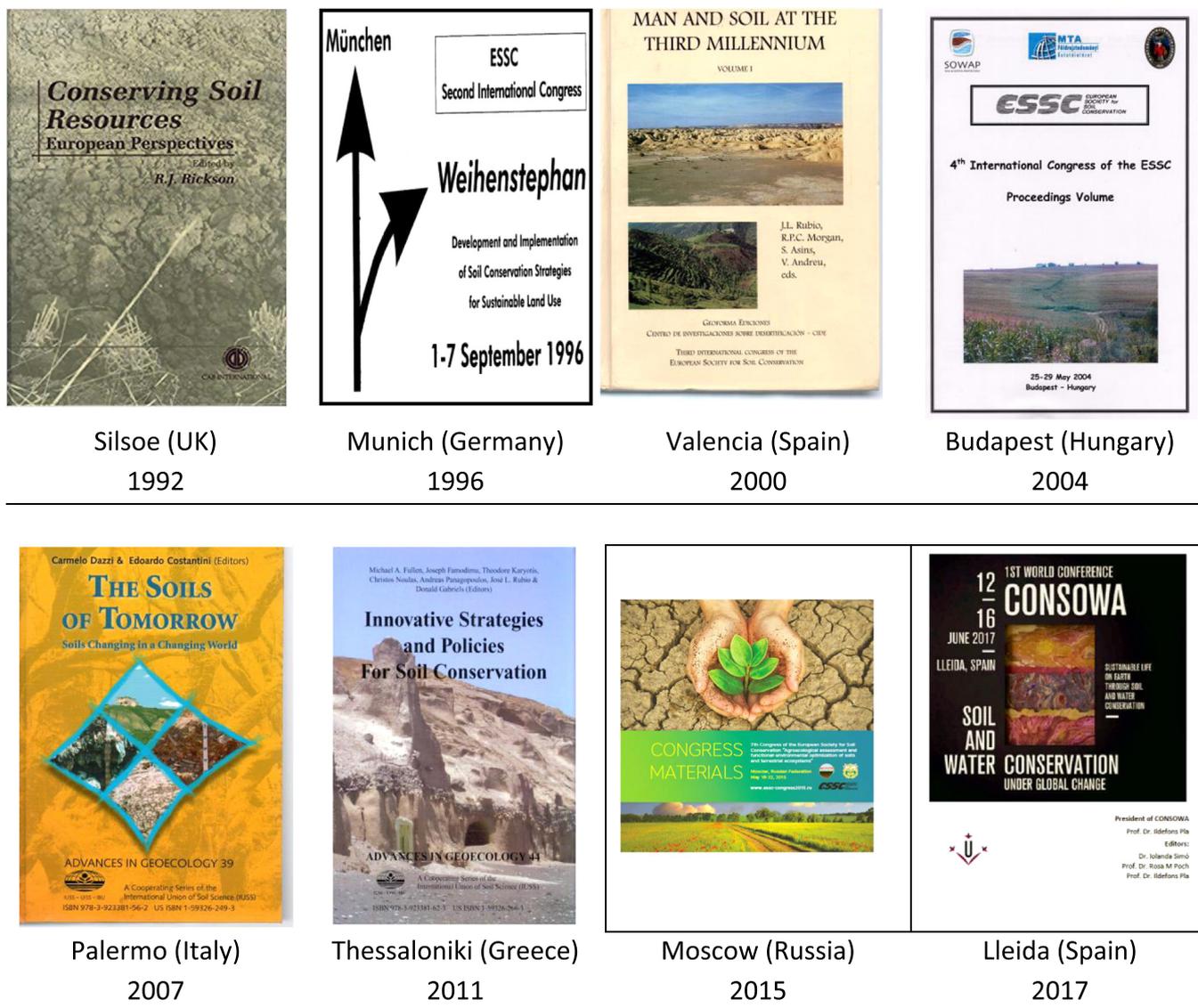


Fig. 5. Cover of the Proceedings and Book of Abstracts of the ESSC International Congresses.

Table 1
Recipients of the ESSC Gerold Richter Award.

Year	Location	Recipient
1996	Silsoe (UK)	G. Chisci (Italy)
2000	Valencia (Spain)	R.P.C. Morgan (UK)
2004	Budapest (Hungary)	A. Kertész (Hungary) and A.C. Imeson (NL)
2007	Palermo (Italy)	N. Yasoglou (Greece)
2011	Thessaloniki (Greece)	J.L. Rubio (Spain)
2015	Moscow (Russian Federation)	M.A. Fullen (UK) and I. Pla Sentes (Spain)

2.2. The ESSC Award

Starting with the Second International Congress (1996), the ESSC Council agreed that every four years, the Society would make awards to those who have made significant contributions to the promotion of soil conservation in Europe. The Awards are:

The Gerold Richter Award: for outstanding contributions to soil conservation and protection within Europe. This is awarded to a

person who has, over the period of his or her career, made significant and internationally-recognized contributions to the investigation and/or promotion of soil conservation in Europe (Table 1). The contributions may be in research, practise, policy-making or any other activity deemed appropriate. The recipient should be a member of the ESSC, but this is not mandatory.

The ESSC Young Person's Award is for the understanding and promotion of soil conservation in Europe. This is awarded to a member of the Society, aged 40 years or under, who over the previous four years has made an important contribution to soil conservation in Europe through research, practise, policy-making or any other appropriate activity (Table 2).

2.3. ESSC grants

Starting from 2007, the ESSC has provided two grants of €500 each to two young researchers (less than 35 years old) who are members of the ESSC, to support their participation at an ESSC Congress or Conference. To date, the ESSC has awarded 18 grants, including four young researchers from non-European countries.

Table 2
Recipients of the ESSC Young Person's Award.

Year	Location	Recipient
1996	Silsoe (UK)	Jürgen Schmidt (Germany)
2000	Valencia (Spain)	Stefan Doerr (UK)
2004	Budapest (Hungary)	no award
2007	Palermo (Italy)	no award
2011	Thessaloniki (Greece)	no award
2015	Moscow (Russian Federation)	Maria Fantappiè (Italy)

Information concerning the grants is spread via the ESSC web-page, by e-mail and the ESSC Facebook page:

<https://www.facebook.com/European-Society-for-Soil-Conservation-ESSC-100528363448094/>
(accessed 25/10/18).

3. A vision for the future

We are members of a Society that champions soil conservation. We must conserve and take care of the soil. We have to preserve the soil. For what? To improve soil quality and soil health? Or, simply to maintain current soil quality at the same level? Should soil be conserved to prevent off-site impacts, such as deterioration of water quality by eroded sediments? Or are we aiming for better environmental quality overall? As stressed by Gabriels (2000), we are using the expression “we” on purpose. “We” means also that “we” wish to share “responsibilities.” “We” refers to a society, a club, a region. The term “we” is used many times and in multiple contexts. “We” need more research. “We” must design strategies for soil conservation. “We” have to reclaim and restore land. But who is who, who is “we”? “We” are each and every member of society, because everyone benefits from the diverse goods and services we gain from soil, namely food security (affordable, adequate and accessible supply), protection from floods, droughts and pollution, biodiversity, cultural services such as recreation and leisure, and support for the built environment.

Soil conservation cannot be the domain of academics only. We already know a great deal about the nature of soil resources and the theory of good soil and land management. A major question is how to persuade the general public to manage and use soil resources better. Conserving soil fertility, combatting physical and chemical degradation of soils, including soil erosion, concerns all Europeans. Therefore, we need to share, analyse and compare common knowledge and expertise beyond and across the borders of our small territories. Italy, for example, is facing problems that in many aspects are comparable to Spain or Greece. Soil degradation in northern France or southern England is representative of hazards assessed all over the European loess loamy areas, even eastwards into Ukraine. Our mountain ranges experience similar problems of forest and soil degradation and related slope instability.

There are ample possibilities to reverse such negative trends. The current scientific and technical ‘state-of-the-art’ can provide the means to greatly improve the situation, providing that suitable land-use and management measures for soil and water conservation can be adopted and adapted and as long as socio-economic and political conditions are favourable. Public opinion has recently become increasingly aware of such problems. However, the uptake of interventions to reverse soil degradation remains quite low - much below the required level. Soil and water conservation must be at the heart of education at all levels, multi-disciplinary research, soil surveys and assessments, and plans for socio-economic development. This will ensure future action to control soil and water degradation.

Other important aspects for consideration in the near future derive from the new open scenarios for soil conservation displayed because of new scientific, environmental and social perceptions and needs. Increasingly, there is recognition of the crucial role that soil plays in food production, ecological functions, regulation of the hydrological cycle and mitigation of climate change and how these processes have implications for global issues, such as environmental security, poverty and human migration. In all these aspects, new soil conservation approaches should be developed to offer answers to scientific and social demands. The science of soil conservation has important challenges ahead to actively contribute to better scientific understanding of soil functions, using innovative approaches for the protection and sustainable use of soil. This is the core purpose and mission of the ESSC.

We are going to face problems and priorities that are both old and new, resulting from scenarios involving soil degradation and soil conservation. To some extent, these challenges come from the perceptions people have of soil. From the first concepts of soil as an essential element in food production, gradually other views or conceptual models have been added, which have given answers to the different socio-economic needs of each period.

Currently, the size and sensitivity of the natural environment oblige the scientific community to devote time to different aspects of the study of soil functions, considering new approaches, foci and methods. Answers are needed to satisfy the growing demand for information and scientific knowledge about the soil generated by many different sectors; including scientific, academic, environmental, agricultural, forestry, landscape, planning and administration.

In Europe, the perception of soil was traditionally linked to agriculture, ignoring the fact that soil functions support virtually all human activities in some way. The European Commission (EC) has given major support to soil conservation. The Common Agricultural Policy (CAP), in particular, has various instruments to promote sustainable use of soils. The principal of cross-compliance links direct payments to compliance by farmers with basic standards to maintain land in good agricultural and environmental condition. It therefore sets a baseline for agri-environmental measures and encourages sustainable soil use. In short, farmers are paid to protect the soil and other resources they use. The direct payments available to farmers can also be linked to their compliance with ‘greening measures,’ which can also contribute to the conservation of good quality soils. These measures, which can account for $\leq 30\%$ of direct payments, require farmers to diversify crops, maintain permanent grassland and to dedicate 5% of arable land to ‘ecological focus areas.’ These actions contribute to making soil more resilient, conserving and potentially increasing soil carbon and protecting biodiversity. For further information on EC soil-related policies, please visit: <https://ec.europa.eu/info> (accessed 25/10/18).

Soil protection is also embedded in Rural Development Programmes (RDPS), funded by the European Agricultural Fund for Rural Development and managed by member states themselves. Notable components include the promotion of resource efficiency, and restoring, conserving and enhancing ecosystems related to agriculture. These are two of the six key priority areas for rural development, and soil is a significant and integral component of this programme. These measures have made positive impacts. Recent work carried out by the EC Joint Research Centre (Ispra, Italy) concluded that between 2000 and 2010, the rate of soil erosion has decreased by 9% in total and by 20% on arable land.

The sustainable use of water and soil go hand in hand and the EC is investing in this area. The Agricultural European Innovation Partnership (EIP-AGRI) is also working on soil. Several focus groups, which consist of expert groups that propose orientation for future projects, are working either directly or indirectly on soil

issues. For instance, one of these groups has produced a brochure on 'Soil Organic Matter Matters.' In addition, operational groups are also working on this issue, with ~5% of all operational groups working on soil management.

The communication on the future of food and farming by the EC of December 2017 highlighted how soil conservation will continue to be a priority. However, the next CAP will aim at a more targeted, ambitious yet flexible approach, giving the responsibility to member states to design a mix of mandatory and voluntary measures to meet environmental and climate objectives defined at EU level. This will allow instruments to be better adapted to local needs and requirements, while still complying with ambitious EU goals:

<https://ec.europa.eu/info/files/communication-future-food-and-farming> (accessed 25/10/18).

4. Conclusions

An ESSC priority is to widen and raise awareness among European citizens and administrators of the importance of soil and its functions, involving different areas of expertise. In this context, the ESSC brings together experts from many disciplines (including environmental engineers, environmental economists, epidemiologists and physicists) to add social and economic dimensions of soil management, so that this finite precious natural resource can acquire enhanced consideration in all spheres of European society (Dazzi & Costantini, 2011).

Contemplating the next ESSC period, we would like to share with you the feeling that our Society has made good progress over the last 30 years, and it is now a consolidated scientific network, with increasing recognition and influence. Our activities over the last three decades have created a positive reputation and made the ESSC an acknowledged reference point as an independent, non-governmental, scientific and professional organization concerned with soil degradation and conservation, both in Europe and globally (Rubio, 2007). ESSC members are often asked for their expertise and advice on different fields of soil conservation by European scientific institutions and policy-makers.

The near future is a challenging period for soil issues. However, we are sure that this will also be a period of great scientific opportunities for soil conservation. If we have the commitment and inspiration to contribute with innovative and appropriate approaches, we can make numerous scientific impacts. As the leading soil conservation society in Europe, we offer responses to European demands and we will make our Society even more useful and valuable. This would be the fulfillment of the famous axiom of US President Franklin Delano Roosevelt "the nation that destroys its soil destroys itself" (Letter to all US State Governors on a Uniform Soil Conservation Law, 26 February 1937).

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