NEWSLETTER 1/2015

ESSC EUROPEAN SOCIETY for SOIL CONSERVATION

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Impaired soil functions (productivity, biodiversity, carbon stocks, water and sediment regulation, buffering and filtering capacity) caused by excessive land levelling prior to vine plantation, Montalcino, Tuscany, Italy (photo by Edoardo A.C. Costantini, Florence/Firenze, Italy).

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United Nations World Soil Year 2015

Friday 5 December 2014 heralded the second 'United Nations World Soils Day' and the beginning of the 'United Nations International Year of Soils 2015.' The United Nations is increasingly recognising the importance of soil as a resource essential to the survival of humanity. Only 29 % of the surface of the Earth consists of land. Of this land, only about 11 % can be used to grow arable crops. The rest is too steep, hot, cold, wet or dry for crop production. At the same time this thin superficial skin of the Earth is under many pressures. These pressures include soil erosion, the expansion of deserts, contamination of soil with salts or pollution, loss of soil organic matter, urban expansion and an ever growing world population (currently 7.2 billion people[1]) to feed and rapid climate change.

His Majesty King Rama IX, the King of Thailand, advocated the establishment of a 'World Soil Day,' to help focus global attention on the importance of soil as a resource. The United Nations General Assembly agreed to the King's suggestion and specified 5 December as 'World Soils Day.' This date was chosen as it coincides with the King's birthday. The first 'World Soils Day' was on 5 December 2013 and the second was on 5 December 2014. 'World Soils Day' will be celebrated on 5 December in future years. The UN also proclaimed 2015 as the 'World Year of Soils.' It is estimated that the world community of about 60,000 Soil Scientists celebrated 'World Soil Day' and the commencement of 'World Soil Year' on 5 December 2014.

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[1]Note: The estimated global population at 1412 GMT on 25 September 2015 was 7,274,992,989. This population is growing by about 10,600 people per hour. Source: http://www.census.gov/ipc/www/worldpop.html

This issue of the ESSC Newsletter presents the 24th of our 'Guest Editorials.' This is an opportunity for leading authorities in the soil science community to offer their perspectives on issues relating to soil conservation. This contribution is from Edoardo Costantini (Florence/Firenze, Italy).

Catena Verlag has kindly agreed to publish a book based on Guest Editorials. This will be entitled **'Global Perspectives on Soil Conservation.'** This will form part of the Catena 'Advances in GeoEcology' series. In principle, it is agreed that there will be future volumes, associated with the four year cycle of Congresses of the ESSC. Work on Volume 1 is progressing well.

Soil information in the Strategic Environmental Assessment of Rural Development Plans

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Introduction

Soil information is essential for land planning at different administrative levels. Currently, in Europe there is a hierarchy of at least seven main territorial administrative entities which consider soil in their land planning policies. They are: the European Union, Member states, Regions, Mountain communities, River basin authorities, Provinces and Municipalities. The first three are the main policy levels where soil is directly or indirectly considered.

This paper discusses European, national and regional regulations that affect soil, giving a better focus on the Strategic Environmental Assessment of the Rural Development Plans 2014 – 2020. Both old and new soil indicators are introduced, as well as the consequences of their adoption for soil science and soil scientists.

Land planning and the Common Agricultural Policy (CAP)

There are three broad objectives of land planning policies: i) regulation or limitation of specific activities; ii) stewardship of actions; iii) support and stimulation of economic activities, usually through monetary subsidies. They all are found in the laws and directives relating to soil. An example of the first kind of policy is the so-called 'Nitrate Directive' (Council Directive 91/676/EEC; 12 December 1991) concerning the protection of waters against pollution caused by nitrates from agricultural sources. Member states adopted regulations based upon soil qualities, in particular water drainage, storage and purification capacity, as key at-

tributes to designate 'Nitrate Vulnerable Zones' (NVZs), regulating the spreading of nitrogen fertilizers and slurries. The precise identification of zones was usually the responsibility of the regional authorities within Member states.

There are many soil stewardship activities at different administrative levels (Table 1). However, the most effective policies are usually based on monetary subsidies. In that regard, the Common Agricultural Policy (CAP) is the most important and complex of EU policies. In the period 2014 – 2020, it will continue to represent, at € 362.79 billion, the largest share of EU spending (€ 960 billion).

As it is well known, the 'Agenda 2000' reforms divided the CAP into two 'Pillars': production support and rural development. The First Pillar of CAP, supported by the European Agricultural Guarantee Fund (EAGF), provides direct payments linking farmers to adherence to cross-compliance rules, which are mandatory (Plate 1). The rules are basic standards concerning the environment, food safety, animal and plant health, and animal welfare, as well as the requirement of maintaining land in good agricultural and environmental condition[1]. On 1 January 2015, the first pillar was strengthened after the introduction of the so-called 'Greening,' or 'decoupled green payments,' which are additional mandatory rules for major farmers (which in turn depend on farm size) allowing them to receive extra financial support.

The Second Pillar of CAP, namely the 'European Agricultural Fund for Rural Development' (EAFRD) supports voluntary measures to be adopted by farmers, aimed at enhancing rural development, with expected cumulative benefits, regarding the environment, quality of life, and agricultural competitiveness. Each Member State or Region must prepare a plan in accordance with the strategic guidelines adopted by the Community.

The Common Strategic Framework (EU Regulation no. 1303/2013) outlines the strategic guidelines and recommends that by 2020, Europe should be inclusive, sustainable and 'smart.' The main novelty of the process of European planning 2014 – 2020 is to ensure that the five structural funds of investment operate in an integrated and synergistic way, in order to achieve the 11 Primary Objectives (Themes) of the Cohesion Policy[2]. The 11 themes of EU cohesion policy define six Priorities, which can be achieved through 18 Key Actions, which are also called 'Focus areas,' in turn detailed in 20 Measures and in a variable number of Sub-measures, which are articulated by Member States and Regions.

[1]In particular, protect the soil from erosion, maintain soil organic matter levels, protect soil structure, and maintain land and habitat protection and water management.
[2]http://ec.europa.eu/agriculture/policy-perspectives/policy-briefs/05_en.pdf

Table 1: Example of policy measures involving soil information at different administrative levels

Aim	Administrative level		
	Global/Europe	Italy	Region
Fight against desertification	United Nations Convention to Combat Desertification (UNCCD, 1994)	Guidelines of the National Plan to Combat Desertification (1999)	Local Action Plan (all regions)
Soil protection	Thematic Strategy for Soil Protection (COM/2002/179)	–	–
	Objectives to prevent soil degradation, conserve and restore the functions of degraded soils (COM/2006/232)	Law 152/2006 (dealing with hydrogeological setting)	Adoption of the soil and potential erosion risk map (some regions)
	Guidelines on best practice to limit, mitigate or compensate soil sealing (SWD/2012/101 final)	–	–
Assessment and management of flood risks	European Directive (2007/60/EC)	Law 267/98 Law 49/2010	Resolution of the regional council (all regions)
Protection of forests against fires	Council Regulation (EEC 2158/92)	Law 353/2000	Management, protection and enhancement of the regional forests (all regions)
Integrated coastal zone management	Communication COM/2000/547 and Council Resolution (94/c 135/02)	Law 152/2006	Resolution of the regional council (some regions)
Groundwater protection	Nitrate directive Council Directive (91/676/EEC)	Law 152/1999	Resolution of the regional council (all regions)

Three Themes involve considerable amounts of soil information. They are:
- Supporting the transition to a low-carbon economy in all sectors.
- Promoting adaptation to climate change, prevention and risk management.
- Conserving and protecting the environment and promoting the efficient use of resources.

Among Priorities, Numbers 4 and 5 are the ones of most relevance for soil. Priority 4 is aimed at restoring, preserving and enhancing ecosystems dependent on agriculture and forestry, while Priority 5 encourages the efficient use of resources and the transition to a low-carbon and climate resilient agri-food and forestry.

Plate 1: *Standard 1.1 of Cross-compliance commits farmers to construct temporary drainage ditches across the slope. An example on the experimental farm of 'Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria-Agrobiology and Pedology Research Centre', Fagna, Florence/Firenze, Italy.*

The focus areas of Priority 4 are:
- Focus area 4A: preservation and restoration of biodiversity, among others in Natura 2000 areas and in agricultural areas of high nature value, and the state of the landscape.
- Focus area 4B: better management of water resources (water quality).
- Focus area 4C: better soil management.

Priority 5 is articulated as follows:
- Focus area 5A: make more efficient use of water in agriculture.
- Focus area 5B: make more efficient use of energy in agriculture and food.
- Focus area 5C: facilitating the supply and use of renewable energy sources, by-products, wastes, residues and other non-food raw materials.
- Focus area 5D: reduce emissions of methane and nitrous oxide from agriculture.
- Focus area 5E: promote carbon sequestration in agriculture and forestry.

The 20 Measures are addressed to one or more Focus areas. An example of possible articulation is reported in Table 2, taken from those developed by the Tuscany Region[3].

[3]http://www.regione.toscana.it/psr-2014

The Strategic Environmental Assessment (SEA)

The Strategic Environmental Assessment (SEA, Directive 2001/42/CE) applies to a wide range of public plans and programmes and is mandatory for agriculture, forestry, fisheries, energy, industry, transport, waste/water management, telecommunications, tourism, town and country planning or land-use, for projects listed in the Environmental Impact Analysis Directive (85/337/EEC) and assessments under the Habitats Directive (92/43/EEC). The SEA Directive has the objective to provide effective environmental protection and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes. It deals with the evaluation of the effects of plans and programmes on the environment, with the aim of ensuring that the requirements of environmental protection are integrated into policy and actions.

SEA is an important contribution to the implementation of Community strategies for sustainable development, by bringing operational integration of environmental concerns into strategic decision-making.

The structure of SEA is based on the following phases:
1. 'Screening': investigation of whether the plan or programme falls within the scope of SEA legislation.
2. 'Scoping': defining the boundaries of required investigations, assessments and assumptions.
3. 'Documentation of the state of the environment:' effectively a baseline on which to make judgments.
4. 'Determination of the likely (non-marginal) environmental impacts:' usually in terms of Direction of Change rather than firm figures.
5. Informing and consulting the public.
6. Influencing 'Decision taking' based on the assessment.
7. Monitoring the effects of plans and programmes after their implementation.

It is mandatory that National or Regional (according to Member States) Rural Development Plans (RDP) for 2014 – 2020 are subject to SEA. The Environmental Report is an integral part of the RDP 2014 – 2020, which details[4]:
- The reference environmental conditions in which the plan operates.
- The coherence of its environmental objectives.
- The environmental effects induced by the plan.
- The monitoring and control of relevant environmental effects.

The Environmental Report should highlight potential impacts, mitigation and compensation measures. It should also take into account the comments received during the consultation phase of bodies with environmental responsibilities regarding the preliminary document for the SEA of the RDP. In the Environmental Report, soil is always taken into consideration, but careful examination of the SEA produced by several Italian and European Regions reveals that soil information is treated much differently in terms of both quantity and quality. Some selected examples illustrate the range of approaches.

Analysis of the environmental context of the RDP of the Tuscany Region[5] declares that the environmental components regarding soil include: *i)* land take and soil degradation, and

[4]http://ec.europa.eu/agriculture/evaluation/guidelines/2014-2020-ex-ante-draft-08-2012_en.pdf
[5]http://www.regione.toscana.it/documents/10180/1185131/Rapporto+ambientale+VAS+PS-R+2014+2020+della+Regione+Toscana+_luglio+2014.pdf/0087f7d9-a4a1-4d74-83c4-2cf2b99a911c

Table 2: Relationships between Focus areas, Measures and Sub-measures in the Rural Development Plans. Example from the Tuscany Region

Focus area	Measure	Sub-measure and actions
4.b Improved management of water resources.	4. Investments in tangible assets.	4.4.1 Conservation and restoration of landscape features, protection and enhancement of biodiversity. 4.4.2 Improving the management and protection of water resources. 4.4.3 Protection of soil from erosion and hydrogeological disorder.
4.b Improved management of soil.	4. Investments in tangible assets. 10. Agri-environment climate payments.	10.1.1 Conservation of soil and organic matter. Integrated and organic agriculture. 10.1.2 Reduction of chemical inputs and water. 10.1.3 Maintenance of olive groves and pastures for environmental/landscape uses. 10.1.4 Management of extensive farming. 10.1.5 Agri-environment climate payments not related to productive investments. 10.2.1 Conservation, sustainable use and development of genetic resources for the conservation of biodiversity.

ii) hydrogeological risk. The two components, however, are detailed in the following four themes: *i)* soil sealing, *ii)* hydrogeological instability (landslides and floods), *iii)* forest fires, and *iv)* agricultural areas located in constrained zones. Therefore, no information about soil characteristics and qualities is considered, in spite of the fact that regional soil maps are available[6].

In the SEA Final Environmental Report of the Northern Ireland Rural Development Programme 2014 – 2020[7], the baseline description of the current state of the environment in Northern Ireland, in respect of each of the sustainability topics, is published in the Environmental Report[8]. The annexed maps deal with: Statutory Designations, including Nature Conservation Sites; Overall Deprivation Rankings; Statutory Designations; Landscape and Cultural Heritage Sites; and Access and Sustainable Transport. No data on soil characteristics and qualities are provided. However, the Report points to Strengths and Opportunities, as well as to Weaknesses and Threats, related to the soil resource. These include:

[6]http://sit.lamma.rete.toscana.it/websuoli
[7]http://www.dardni.gov.uk/rdp-final-environmental-report-.pdf
[8]http://www.seupb.eu/Libraries/2014-2020_Programmes/INTERREG_Consultation_ER_030614.sflb.ashx

Strengths and Opportunities: Significant natural resources including peaty soils, grassland and biomass; Good quality soil and less erosion compared to the rest of the UK; Good proportion of land under agri-environment schemes; Very geologically diverse.

Weaknesses and Threats: Loss of soil organic matter and fertility due to intensification of agriculture; Woodlands typically unmanaged, inaccessible, small and fragmented with limited new planting; Land under agri-environment schemes is fragmented; the economic viability of many farms in Northern Ireland depends on 'Less Favoured Area' funding.

In the SEA Environmental Report of the Rural Development Programme 2014 – 2020 of the Sicily Region, three themes involving soil are reviewed: *i)* soil erosion (Plate 2), *ii)* salinization risk, and *iii)* desertification risk[9]. Discussion of these three themes is illustrated with text and maps, making commendable use of regional soil maps.

Plate 2: *Severe soil erosion before the establishment of sufficient vegetation cover in a new vineyard in Calatafimi, Trapani, Sicily.*

Overall, if we only consider true soil information, that is, the information related to soil as defined by the European Union (COM (2006) 231 final)[10], we can observe that the following types of soil information may be reported in SEA Environmental Reports:

- Soil maps.
- Land unit maps.
- Land capability.
- Land suitability for different uses.
- Potential productivity.
- Vulnerability to nitrates.
- Risk of desertification.
- Less favoured areas.

[9]http://www.psrsicilia.it/bozzapsr/avvioconsultazionevas/Rapporto%20Ambientale%20PSR%20Sicilia%202014_2020.pdf

[10]Soil is generally defined as the top layer of the earth's crust, formed by mineral particles, organic matter, water, air and living organisms. It is the interface between earth, air and water and hosts most of the biosphere.

- Soil erosion risk.
- Soil carbon stock.
- Soil heritage.

It is evident from the studies that soil information is treated very variably, not only because of the different kinds of available information, but mainly as a consequence of the expertise and sensitivity to the soil issues of the authors (they can be different kinds of public or private bodies hired by regional authorities). Therefore, despite having the same reference, the SEAs are very different. In most cases, the amount of soil information is little or negligible, even when available. The *ex-ante* impacts are often only qualitative, or quantified only in terms of the areal extent of applied measures.

As expressed in European Communication COM (2009)[11] and reiterated in 2010 (ENVE-V-001)[12], the general application and effectiveness of the SEA Directive in Member States (MS) are varied, both in terms of the institutional and legal arrangements of SEA procedures and in terms of how individual MS perceive their role. This variety has also influenced how MS have perceived benefits and drawbacks and what measures to take to improve the implementation and effectiveness of SEA.

Besides a more technical review, some general considerations are formulated in the documents, concerning SEA activity, in particular:
- The difficulties which arise regarding implementing monitoring systems, because of the vagueness of actions in the plans and programmes.
- The description of the context is often not accompanied by data, or qualitative and quantitative indicators on the initial environmental baselines, and does not allow establishment of a starting point for the verification of the monitoring results.
- The monitoring consists of verifying the effects of the plan and/or programme, especially through impact indicators. However, the latter are generally difficult to calculate, because they often describe an indirect or protracted effect and therefore require very detailed knowledge frameworks.
- The causal link between the intervention and the effect is not always obvious and interpretation of impact indicators can be complex.
- The absence of clear objectives quantified in the plans or programmes further complicates the operation of effective monitoring systems.

On the basis of these considerations, the future evaluations are recommended to be more focused. Starting from 2015 and for each year of implementation of the RDP, an annual report is expected, dedicated to the construction of specific impact indicators. The Commission delegated regulation (EU) No. 807/2014 of 11 March 2014 supplements Regulation (EU) No. 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and introduced transitional provisions[13]. In particular, in the Common Evaluation Questions for Rural Development Programmes 2014 – 2020[14], for each Priority and Focus Area included in the RDP, the related questions should be answered in the enhanced annual implementation reports (AIRs) submitted in 2017 and 2019, and in the *ex-post* evaluation report. In the cases of Priorities which makes use of soil information they are:

[11]Report of the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the application and effectiveness of the Directive on Strategic Environmental Assessment.
[12]Opinion of the Committee of the Regions on improving the EIA and SEA Directives.
[13]http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L:2014:227:FULL&from=IT
[14]https://enrd.ec.europa.eu/sites/enrd/files/uploaded-files/wp_evaluation_questions_2015.pdf

- P4A: To what extent has the RDP intervention contributed to restoring, preserving and enhancing biodiversity?
- P4C: To what extent have RDP interventions supported the prevention of soil erosion and improved soil management?
- P5A: To what extent have RDP interventions contributed to increasing efficiency in agricultural water use?
- P5D: To what extent have RDP interventions contributed to decreasing greenhouse gas (GHG) and ammonia emissions from agriculture?
- P5E: To what extent have RDP interventions supported carbon conservation and sequestration in agriculture and forestry?

The 2019 mid-term evaluation will add the following questions related to the objectives at EU level. To what extent the actions of the RDP:
- Have helped climate change mitigation and adaptation and to achieve the main objectives of the Europe 2020 Strategy?
- Have helped to halt the loss of biodiversity and the degradation of ecosystem services and to restore them?
- Have helped to ensure sustainable management of natural resources and climate action plans?

Clearly, good quality soil information is needed to provide sensible answers to all these questions. In particular, 'Smart' [15] soil indicators should be used: *i)* to assess the baseline environmental situation in relation to the wider objectives of the programme (objectives-related baseline indicators); *ii)* to assess the direct and immediate effects of the intervention and to provide information on eventual changes that have taken place; *iii)* to assess impacts of the programme both at the level of the intervention, but also more generally in the programme area. Thus, it is necessary that indicators both suitably describe soil qualities and assess the status of soil dynamic functions. These functions include:
- Regulation of biogeochemical cycles and GHG emissions.
- Carbon sequestration.
- Regulation and filtering processes within the water cycle.
- Regulation of sediment production, via effective soil conservation.

These soil functionalities vary every year, specifically as a consequence of the implementation of European measures, and deserve appropriate monitoring activities, able to produce statistics and maps. Therefore, it is possible to foresee that in the next ongoing and *ex-post* evaluations of RDP, we will find thematic information including:
- Actual soil erosion.
- Soil carbon stock.
- GHG emissions from soils.
- Water regulation (including runoff).
- Buffering and filtering capacity.
- Soil biodiversity and potential habitats for organisms.

Specific monitoring, calibration and validation schemes and models must be established to achieve these goals in each regional context.

Conclusions

[15] SMART = S 'specific', M 'measurable', A 'achievable', R 'robust', T 'timely': http://enrd.ec.europa.eu/enrd-static/evaluation/faq/en/indicators.html

Following the European recommendation, the ongoing and *ex-post* reports of the monitoring activities of RDP are expected to provide a wealth of soil information, both qualitative and quantitative. Soil scientists, soil and water conservationists, and management experts will be requested to provide more sophisticated and dynamic types of information, not only based on the usual survey and laboratory analysis, but also on new types of proximal and remote sensing, as well as spatial statistics and modelling. Then the issue of 'big-data handling' and statistical processing of varied spatial data-bases will pose major challenges. The numerous spatial data will stimulate new developments in both software and hardware, jointly with statistical processing and geostatistical analysis, image pattern recognition, satellite image processing and machine learning. Therefore, the SEA of RDP and similar land planning activities will provide greater scientific and technical opportunities for soil science, provided that the public bodies in charge of evaluations, namely Member States, Regions and their auditing counterparts within the European Commission, are able to implement their own recommendations.

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Soil Erosion and Conservation in Romania

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Romania's land area is 23,839,100 ha; 0.16 % of the world's surface. Worldwide, Romania is ranked #83 for areal extent, and it consitutes 4.81 % of Europe's surface (ranked #12). The soil, as a component of land, is a unique natural resource, used as an essential means of agronomic production. Soil is an asset that was not anthropogenically created or produced. Thus, it is irreplaceable. Land ownership should not be viewed as an absolute, but as a conditional right which entails certain obligations (e.g. to cultivate the land and conserve the soil). These responsibilities are both individual and societal.

Land management is typically focused on the need for more efficient land use and resource preservation, given our ever increasing global population and the need for more efficient food production. Often land use is categorized, such that policy-makers and government officials can have some basic understanding of natural resource management, optimized land development and market influences on agricultural production.

Common land types of Romania are presented in Table 1 (Florea, 2003). Romania has 14,856,800 ha of agricultural land, which represents 62.3 % of the total surface; 0.65 ha *per capita*. At the national level, 72.5% and 27.5 % of soils in Romania can be broadly classed as very poor and good/very good, respectively, based on intrinsic soil characteristics, climate, topography and ground-water (Table 2, Florea 2003).

Table 1: Land use categories in Romania

Use	Thousand ha	% of the country surface	% of the surface by use
Arable	9,381.1	39.4	63.1
Pasture	3,441.6	14.4	23.2
Meadows	1,507.2	6.3	10.2
Vineyards	272.3	1.1	1.8
Orchards	254.6	1.1	1.7
Total agricultural	**14,856.8**	**62.3**	**100**
Forests	6,457.3	27.1	71.9
Waters, lakes	867.9	3.6	9.7
Other areas	1,657.1	7.0	18.4
Total non-agricultural	**8,982.3**	**37.7**	**100**
Total surface	**23,839.1**	**100**	**–**

(Source: Florea, 2003).

Table 2. Agricultural suitability of lands in Romania

Suitability class	Category of use							
	Arable		Pastures and meadows		Vineyards and orchards		Total	
	Thousand ha	%	Thousand ha	%	Thousand ha	%	Thousand ha	%
I: very good	357	3.8	55	1.1	2	0.3	414	2.8
II: good	3,368	35.9	222	4.5	78	14.8	3,665	24.7
III: medium	2,373	25.3	604	12.2	115	21.8	3,092	20.8
IV: poor	1,726	18.4	1,772	35.8	120	24.7	3,628	24.4
V: very poor	1,557	16.6	2,296	46.4	202	38.4	4,055	27.3
Total	9,381	100	4,949	100	527	100	14,857	100

Note: I = 100 – 80 points; II = 80 – 60 points; III = 60 – 40 points; IV = 40 – 20 points; V = 20 – 0 points.

Romania has very specific geographical characteristics (Teaci, 1995). These are:

1. Romania is located in the south-east portion of Central Europe at the cross-roads of several high and low pressure centres that form regularly in the region. The influence of these air masses is altered by the presence in the central regions of the Carpathian mountain chain, resulting in a diverse climate with average annual precipitation amounts between 350 – 1,400 mm and average annual temperatures between 2 – 11.5 °C.

2. At the national level, almost all soils in the international classification system are present in Romania (Figure 1); each soil type having specific properties and characteristics.
3. On ~12.5 million ha (7.5 million ha arable), soil fertility is adversely affected by problems such as erosion, acidity, low humus content, extreme texture (clay, sand), excessive moisture and chemical pollution (Figure 2).

These natural and anthropogenic factors dramatically influence agricultural production. Furthermore, soil, climate and topography vary widely at various scales, even across fields within the same farm. Factors restricting the productive capacity of agricultural soils in Romania are listed in Table 3.

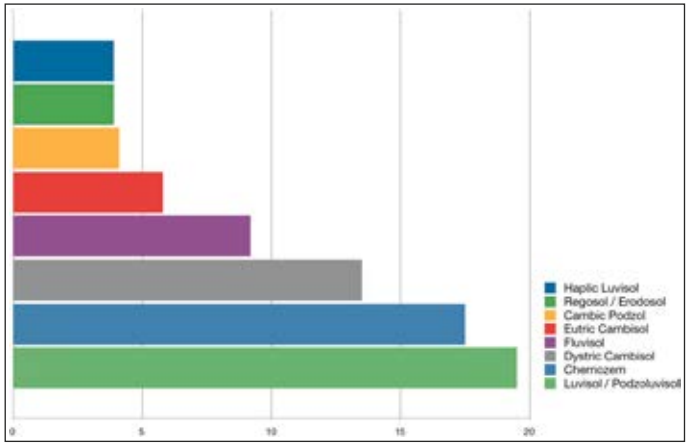

Fig. 1: *Principal soil types in Romania (source: Florea, 2003).*

The **steppe zone** consists mainly of plains and hilly relief, representing the largest part of the Romanian Plain, West Plain and Dobrogea Plateau (Plate 1a,b). The association of soils is represented chiefly by Chernozems, Gleysols, Alluvisols, Vertisols, Solonetz and Psammosols. The limiting climatic factors, which require differentiation for efficient soil management, include: long periods of drought, high temperatures, high frequency winds (wind erosion in areas of sandy soils), low relative air humidity and harsh winter frosts. Negative phenomena most commonly encountered in this area are salinization, excess water, temporary drought and poor to very poor supply of humus, phosphorus (P) and potassium (K).

The **forest-steppe zone** results from the interplay of steppe and forest vegetation zones plus a compact part of the Transylvanian Plain (Plate 2a,b). It occupies the space between 100 – 500 m altitude, including areas north of the Romanian Plain, Buzau Plain, Jijia Plain, Western Plain and Transylvanian Plain. Key soils of the area include Chernozems, Phaeozems, Regosols, Alluvisols, Preluvisols and Erodosols. Limiting factors of the area include: drought, erosion, temporary excessive moisture, soil compaction, slope, exposure, ground-water depth, occurrence of frost periods (especially early/late frosts). The climate is also highly variable between sub-areas. Irrigation and soil and water conservation measures have very important roles in the forest steppe. Most lands in the forest steppe are situated on slopes, so tillage systems must include soil conservation measures. Furthermore, finding the optimum timing of tillage is very important for avoiding secondary soil compaction.

Table 3: Key factors limiting the productivity of agricultural soils in Romania

No.	Limiting factors and degradation processes	Agricultural		Arable	
		thousand ha	%	thousand ha	%
1	Erosion by water	5,663	38.1	4,400	46.9
2	Landslides	702	4.7	–	–
3	Erosion by wind	387	2.6	273	2.9
4	Frequent drought	7,100	47.8	5,200	55.4
5	Salinization	614	4.1	400	4.3
6	Temporary excess of moisture	4,100	27.6	3,800	40.5
7	Subsoil compaction	2,800	18.8	2,060	21.9
8	Topsoil compaction	*	*	6,500	69.3
9	Skeletal topsoil	300	2.0	52	0.5
10	Low and very low content of humus	7,304	49.2	4,445	47.4
11	Moderate and strong acidity	3,420	23.0	1,636	17.4
12	Strong alkalinity	162	1.1	121	1.3
13	Low nitrogen content	3,348	22.5	2,563	27.3
14	Low content in accessible phosphorus	4,473	30.1	2,956	31.5
15	Low content in accessible potassium	498	3.3	259	2.8
16	Lack of micronutrients (e.g. zinc)	*	*	1,500	15.98
17	The risk of crusting and closing of pores	*	*	2,300	24.5
18	Removal of soil through various works	15	0.1	*	*
19	Soil coverage with solid waste	18	0.1	11	0.1
20	Chemical pollution of soil	900	6.0	*	*
21	Oil pollution	50	0.3	*	*
22	Waste pollution brought by air	147	0.99	82	0.87

* missing data
(Source: the Research Institute for Soil Science and Agricultural Chemistry, 2003).

The **forest area** is the largest vegetation area in the country (Plate 3a,b). The overall area includes lands bounded on the outside by the forest steppe and the interior boreal mountain floor. The forest area contains a diversity of landforms and climatic conditions that favoured the formation of various regional soils with a high percentage of Preluvisols (reddish brown, brown clay, illuviated soils) and Luvisols (Luvic Brown, Albic Luvisols). Limiting factors include complex topography, small field surfaces, excess surface moisture, low soil fertility, soil erosion, landslides, primary and secondary soil compaction, soil acidity, pronounced diverse spectrum of weeds and poor vegetative development opportunities compared to other areas.

In hilly and mountainous regions, the main limiting factor of crop production is the very

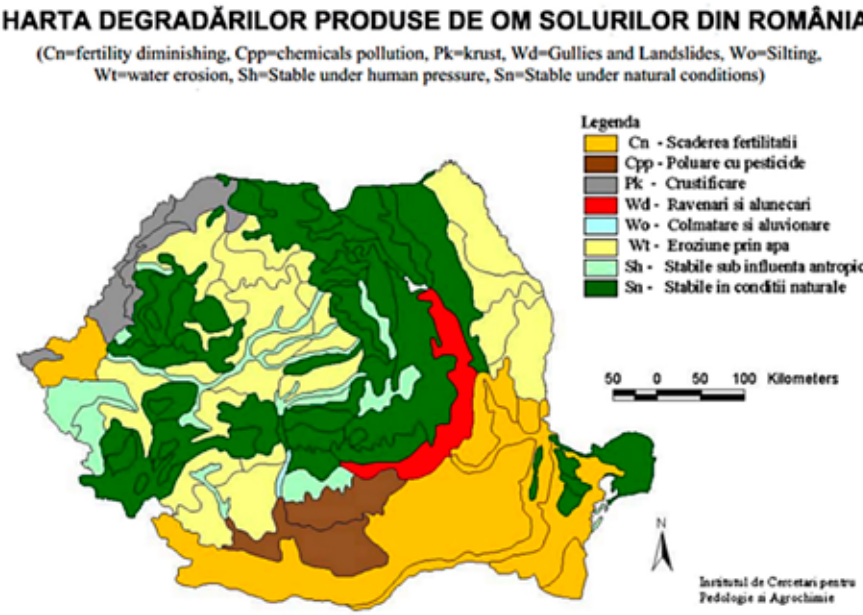

Fig. 2: *Map of soil degradation produced by human activity in Romania (source: the Research Institute for Soil Science and Agricultural Chemistry, 2013).*

diverse topography with slopes in all shapes and sizes. Hilly slopes have a significant share in the physical and geographical units of Romania, particularly on the Moldova Plateau, which is seen in the curvature of the Carpathian area in the plains, west hills and the entire Transylvanian Basin. Some two-thirds of Romania, 48 % of agricultural land and 30 % of arable land, are situated on slopes and are exposed to erosion. The counties with the largest agricultural areas are located in Moldavia (Vaslui, Vrancea), Transylvania (Cluj, Bistrita-Nasaud, Alba) and Banat (Caras-Severin). Most arable lands on slopes are located in the agricultural zone of the forest steppe and forestry area.

On sloping lands in Romania, it is estimated that each year ~125 million tonnes of soil is eroded (Neamtu, 1996), of which ~35 % is transported into river systems. Thus, ~33 % of the agricultural area is affected by slope erosion processes and landslides. The land uses which are most affected include orchards (65.6 %), grasslands (58.3 %) and arable lands (20 %).

Romanian land distribution on groups of slopes is as follows:

- 1.5 million ha of arable land on slopes between 5 – 10 %.
- 1 million ha of arable land on slopes between 10 – 20 %.
- 470,000 ha of arable land on slopes between 20 – 30 %.
- 200,000 ha of arable land on slopes between 30 – 45 %.

Soils on slopes present specific features: the edaphically useful volume is decreased (Regosols, Lithosols, Rendzinas) on the southern slopes. There is lower structural stability (Podzols and Podzolic soils for north and west slopes), and an excess of moisture on the northern slopes (black soils, Clinohydromorph). The diversity of soils and their characteristics is com-

plemented by the superimposition of several processes of degradation, such as surface and deep erosion, landslides, excessive moisture and compaction.

Harnessing the sustainable arable lands on slopes and their conservation implies that the organization of the territory and differentiated soil management will achieve the following:

1. Cultivation of an assortment of plants suitable for the purposes and conditions offered by the slopes and design of crop rotations with a soil conservation role.
2. Use of anti-erosion culture systems on slopes, level curve direction in strips, grassed strips and arable terraces.
3. Application of differentiated soil management elements, respecting regional planning projects.
4. Soil tillage parallel to slope contours.
5. Adaptation of agro-components such as: fertilization, integrated control of weeds (especially herbicide application) and maintenance, mechanization and harvesting of land in accordance with specific land types.

In recent years, national legislation has made significant steps in soil monitoring and soil conservation. Instruments include the 'Government Emergency Ordinance 38/2002' and 'the Order of the Ministry of Agriculture and Rural Development regarding the Programme 278/2011 of achieving the National System for Monitoring Soil-Land for Agriculture and Soil-Forestry and Forest Vegetation.' Given the serious problems on sloping lands, an essential change is expected from the effects of 'Government Emergency Ordinance 34/2013' on the organization, administration and operation of permanent grasslands. Here one may include the cross compliance rules, including the 13 GAEC (Good Agriculture and Environment Conditions), the 15 Minimum requirements for fertilizer and plant protection products and the 15 SMR (Statutory Management Requirements).

The most important problems that have not been resolved are related to the lack of laws on the use, conservation and protection of soil and poor implementation of existing legislation. For agricultural lands the greatest challenge is the lack of agrochemical mapping of the obligatory update at the farm level for all land every four years, as exists in most EU countries. The objective of this requirement is the periodic monitoring of soil fertility status in order to establish the need for proper fertilization and optimize production in terms of effectiveness of fertilization, technological efficiency, soil resource conservation, water conservation and environmental protection. In the absence of of this requirement, fertilization is done most often without the necessary soil and agrochemical survey, which is a standard for maintaining a minimum level of maintenance of agricultural land.

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Plate 1a,b: *The steppe zone.*

Plate 2a,b: *The forest-steppe zone.*

Plate 3a,b: *The forest area.*

Report on the '7th Congress of the ESSC,' held in Moscow (Russian Federation) from 18 – 22 May 2015

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ESSC Executive Committee and Council 2016 – 2020

At the '7th Congress of the ESSC,' held in Moscow (Russian Federation) from 18-22 May 2015, the following were duly elected:

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Simone Priori. Winner of the ESSC Travel Grant to attend the '7th Congress of the ESSC in Moscow from 18 – 22 May 2015

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As a researcher and member of the ESSC, I express many thanks to the ESSC for the grant, which supported me to attend the ESSC Congress in Moscow. I am a young researcher who works at the 'Italian Council for Agricultural Research and Economics,' in Florence. I studied soil genesis and palaeopedology for my Ph.D. thesis (2009). Since then most of my research work has focused on proximal soil sensing, digital soil mapping and soil monitoring.

I am involved in several research projects concerning soil conservation and ecosystem services, and, as a young researcher, I need a good contact network of people involved in such studies. Therefore, ESSC international conferences and workshops provide good opportunities for me. Last year I joined my first ESSC conference, which was held in Imola (Italy) on the topic of 'Biogeochemical Processes at Air-Soil-Water Interfaces and Environmental Protec-

tion.' It was very stimulating and interesting. Therefore I decided to participate in the ESSC Congress in Moscow (Plate 1).

The Congress gave me the opportunity to meet several Russian and east European colleagues. This was important for me, because I had no contact with these countries before the Congress. Moreover, I had the opportunity of visiting the Russian School of Soil Science, where much of modern soil science was born, thanks to Vasily Dokuchaev. I very much appreciated the field trip to the Yaroslav Region and the soil profiles described and explained by Professor Yashin (Plate 2).

Thanks again to the ESSC and to the Russian Timiryazev State Agrarian University for the nice and stimulating Congress!

Simone Priori

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Plate 1: *ESSC President Professor Carmelo Dazzi and Dr Simon Simone Priori at the 7th Congress of the ESSC in Moscow in May 2015.*

Editor's note: Further information on the Moscow Congress will be reported in ESSC Newsletter 2015/2.

Plate 2: *Participants studying soil profiles during the field trip to the Yaroslav Region.*








3RD GLOBAL SOIL WEEK 2015
19 – 23 APRIL 2015, BERLIN
DIALOGUE SESSION 1.1:
'FOOD SECURITY AND SUSTAINABLE FOOD SYSTEMS: THE ROLE OF SOIL'

Report
20 April 2015

Organised by:		
Centre for Sustainable Development	CENESTA	Iran
World Centre for Sustainable Development	RIO+ Centre	Brazil
Bread for the World Germany	Brot dür die Welt	Germany
Participatory Ecological Land Use Management Association	PELUM	Zambia
European Society for Soil Conservation & World Associationof Soil and Water Conservation	ESSC & WASWAC	Spain
Centre for Development and Environment	CDE	Switzerland
Soil Fertility Consortium for Southern Africa	SOFECSA	Zimbabwe
Institute for Advanced Sustainability Studies	IASS	Germany

Abstract

There is a general consensus that healthy soils are pivotal for food security. Food production is one of the main ecosystem services provided by and thus dependent on well-functioning soils. There are also intrinsic connections between the four pillars of food security: food availability, access, utilization, and stability; with how soils are managed, accessed and secured, in particular by food insecure and vulnerable populations. On the other hand, socio-political and economic processes that precipitate inequalities and heighten vulnerabilities among poor populations often increase pressure on soils due to unsustainable forms of land use and poor agricultural practises. This has often led to scenarios that can be described as: 'poor soils, empty stomachs (hungry people) and poor livelihoods.' In 2015, in particular, as we head towards approval of the 'Sustainable Development Goals' (SDGs), the role of Financing for Development is debated and agreed upon and a new climate pact is signed; these three political dimensions define how a new post-2015 agenda needs to be people-smart as well as resource-smart. For proposed SDG 2 (Food Security and Hunger), there can be no resolution without addressing people, policies and institutions.

Understanding the connections between soils and food security

Not all connections between soils and food security are clearly articulated in food debates. Is food produced in healthier soils also more nutritious? Under which contexts are soils crucial for achieving food security and under which contexts there are more urgent issues to address? These and many other questions emerge, indicating there is potential to understand, in more precise terms, how improved governance and management of soils could lead to sustainable food security. Additionally, the connections between soils and food security needs to be integrated within broader discussions around sustainable development, in particular, sustainable food systems and their influence on the three pillars of sustainability: economic, social and environmental. In other words, we first have to envision the role of soils and food security and then discuss strategies for transforming the reality towards this goal.

Imagining soils in a sustainable future and creating the strategies for achieving it

One promising way of addressing this is to integrate the discussion on the emerging concept of food sustainability, which considers, beyond environmental integrity and food security, the ideas of right to food, poverty and the reduction of disparities and deprivations, and the effects this has on social-ecological resilience.

Initially, the session discuss the links between soils and food security, touching on how they are articulated in different scales and contexts. Additionally, we also approach these issues on the strategic level, seeking to connect the discussion points with ongoing relevant political debates at the global level, in particular around: (i) food security and agroecology and (ii) food security and climate-smart agriculture (CSA).

Our expected outcomes:

- Build up further consensus on the links between soils and the four dimensions of food security.
- Articulate clearly the link between resource inequality, people-smart approaches and triple-wins in food security.
- Identify critical research and implementation gaps that could catalyse action on food security in the context of the SDGs.
- Identify potential new coalitions that could transform pathways to sustainable food security into 2030.

Final Programme

Understanding the connections between soils and food security

14.00 Opening
Matheus A. Zanella. IASS (Germany)

14.10 Soils and the four dimensions of food security: how are they articulated?
Prof. José Luis Rubio, ESSC & WASWAC (Spain)

14.25 Scale and contexts: when soils are crucíal for food security
Faustin Vuningoma. Secretary-General, PELUM Association (Zambia)

14.40 First round of debate

Imagining soils in a sustainable future and creating the strategies forachievingit

15.00 Transition to Working Groups

15.15 Working groups:

Agroecology, sustainable food systems and soils

Maryam Rahmanian, CENESTA (Irán) & Carolin Callenius, Bread for the World (Germany)

Climate and agriculture agendas: resource equality and people-smart agriculture

Leisa Perch, UNDP RIO Centre (Brazil) & Matheus A. Zanella, IASS (Germany)

16.00 Coffee Break

16.30 Continuation of working groups

17.00 Presentation of results and discussions of working groups

17.30 Last round of debate

Summary of discussions

Part 1: Understanding the connections between soils and food security

With an audience of approximately 75 participants, the session was opened by Matheus A. Zanella (IASS), who introduced the two main objectives of the afternoon:

(i) **To clarify the connections between soils and food security** in the context of its four dimensions (availability, access, utilization, stability).

(ii) To discuss **how these connections are being treated in ongoing relevant political debates** at the global level, in particular the debates on: (i) food security and **agroecology** and (ii) food security and **climate-smart agriculture** (CSA).

The presentation of José Luis Rubio (ESSC and WASWAC) provided an **overview of the relevance of soils to food security,** focusing on the access component. Insecure access to land, to nutrients, to markets and institutional insecurity (unfavourable or *against*-poor policies) were discussed as important restrictive factors regarding the dimensions of availability, access and stability of food security. Professor Rubio also commented that **soil degradation processes** (such as desertification) are ultimately **cause and consequence of poverty and food insecurity** and the occurrence of these processes frequently follows a non-linear interrelationship. Two examples were threshold mechanisms (sudden shifts that trigger non-linear impacts) leading to poverty traps and in desertification (level of no return). How these processes contribute to violent conflicts in many parts of the globe was also observed. In his concluding remarks, Professor Rubio balanced optimistic and more realistic visions on how soils are being treated in political agendas. While on the one hand **soils are increasingly being regarded as a key component of our sustainable future,** the challenges are still enormous, even more considering that **the problem as well as the solution is a political one.** His suggestion to the soil community is to **leave the ghetto and increase its advocacy capacity,** in his words *"be active, be belligerent! We should go to society, to institutions, to media."*

Faustin Vuningoma (PELUM) offered a passionate account of his experience in working for many years with smallholder farmers from Southern Africa in sustainable soil management. Mr. Vuningoma agreed that **the reason** for food security's continued high prevalence in

some areas around the world **is indeed a political one,** more specifically **lack of political prioritization to smallholder agriculture and disregard of its capacity to sustainably feed the growing population.** He critically addressed supposed simple solutions, such as distribution of fertilizers, as pretentious 'silver bullets' to rapidly increase agricultural production, but without touching the real causes of food insecurity. Mr. Vuningoma reported real-life stories of how technological packages based **on hybrid seed and chemical fertilizers** ultimately **created dependency and decreasing returns** for smallholder farmers, besides **deviating policy attention away from more long lasting potential community-based solutions,** such as conservation agriculture, agroforestry and agroecological systems.

During the initial round of discussion, some clarification points were raised by the audience with respect to the relationship between soil degradation processes and conflicts. It was discussed that all conflicts have several interconnected and multi-faceted causes and to reduce them to the single cause of degradation of the natural resources base might be oversimplifying the issue. The audience also commented that **technological packages,** such as those mentioned in the presentation of Mr. Vuningoma, might prove to be effective in the short-term, but with several unintended consequences in the long-term, **including soil exhaustion and complete dependency on external inputs for soil fertility management.** Considering the increasing climate stresses already manifesting in many parts of Sub-Saharan Africa, **there is a strong need to abandon 'business-as-usual' practices currently pushed by corporate agriculture.** In this view, **sustainable management of soils requires a holistic approach** (e.g. those associated with the agroecology discourse) to landscape management that improves the natural resource base in the long-term, instead of degrading it.

Part 2: Imagining soils in a sustainable future and creating the strategies for achieving it

After a break, two working groups were formed:

(i) Co-ordinated by Maryam Rahmanian (CENESTA) and Carolin Callenius (Brot für die Welt): **'Agroecology, sustainable food systems and soils,'** with approximately two-thirds of the session's participants (50 people).

(ii) Co-ordinated by Leisa Perch (Rio + Centre) and Matheus A. Zanella (IASS): **'Climate and agriculture agendas: resource equality and people-smart agriculture,'** with approximately one-third of the session's participants (25 people).

Before transitioning to the working group format, Ms. Rahmanian (CENESTA) and Ms. Perch (RIO+ Centre) introduced the topics of each one of the working groups, respectively. Ms. Rahmanian suggested that agroecology can be understood as a diverse set of production systems in which **locally-available resources for soil fertility and biological control are privileged over costly external inputs** such as chemical fertilizers and pesticides. Agroecology is gaining political momentum world-wide through active involvement of global farmer's movements. Thus, it was the purpose of the working group to discuss the topic with *"activistic lenses,"* i.e., **finding entry points for political incidence.** Ms. Perch commented that one of the current major challenges in the sustainable development agenda is related to how to address the **relationship between climate and agriculture through a people-centred approach.** Technological solutions will surely be needed, but these will necessarily have to be embedded in processes related to social and political aspects, such as promoting greater resource equality, otherwise there is a risk of significant failure. This approach is what she mentioned as ***"climate-smart and people-smart agriculture,"*** and the purpose of the working group was to discuss if this perspective was being considered when

addressing soil policies around the world and in what context. The following tables present a summary of the discussions held within each working group.

Working Group 1: 'Agroecology, Sustainable Food Systems and Soils'

Maryam Rahmanian (CENESTA) and Carolin Callenius (Brot für die Welt)

Agroecology uses ecological concepts and principles for the design and management of sustainable agricultural systems, in which natural, locally-available resources for soil fertility and biological control are preferred to expensive external inputs, such as chemical fertilizers and pesticides. Healthy soils are just one element, just as water or biodiversity, in making this farming system successful. But Agroecology is far more than being a production system alone. It comprises the food system as a whole. So it includes social and political aspects of rights, access to markets, decision making, and much more. La Via Campesina, the world- wide alliance of small holder peasants, formulated in the 'Declaration of the International Forum for Agroecology' (25/02/2015) a common understanding of Agroecology and described strategies.[1]

Agroecological principles take different technological forms depending on the environmental, social and economic circumstances of each farm or region. When designed and managed with agroecological principles, farming systems become more diverse, productive, resilient and efficient. As an example from Greenpeace, agroforestry proved to be an economically-viable solution for farming systems in Malawi.

Chemical fertilizers and other technological innovations are welcomed, if their use improves productivity for farmers, does not harm the environment and is adapted to the local situation. Employing them therefore needs to be shaped by long and not short-term considerations only. But are mineral fertilizers accessible and sustainable in the hands of smallholders? If prices of fertilizers are rising, the cost is quickly beyond the economic capacity of small-holders, also depleting the soil nutrient fund. Sustainability of production, also for the next generation, is central for Agroecology. Technological fixes often prove to be inadequate to deal with the more complex reality.

Agroecological systems are deeply rooted in the ecological rationale of traditional small-scale agriculture; farming systems characterized by a diversity of food, seeds, and knowledge on interactions between soil, water and biodiversity management regimes in the specific context. These knowledge systems also need to be sustained, as in their diversity they increase resilience. Moreover, agroecology implies access of small-scale farmers to land, seeds, water, credit and local markets, partly through the creation of supportive economic policies, financial incentives, market opportunities and agroecological technologies. In addition to the practises of the farmers themselves, agroecology as a movement also includes scientists and social movements. They are also asking central questions of power relations: who owns the food and controls the food system? Being part of this movement poses new challenges for scientists requiring a need to understand farmers in the context of their farming systems and thus making research results more relevant to their needs.

Challenges ahead:

The political trend does not seem to go towards agroecology. Industrial agriculture seems to be the dominating concept underlying political decisions. Agroecology should be a key

[1] http://viacampesina.org/en/index.php/main-issues-mainmenu-27/sustainable-peasants-agriculture-mainmenu-42/1749-declaration-of-the-international-forum-for-agroecology

concept when formulating policy frameworks, be it on national or regional level. Brazil has been mentioned as a country where a policy for agroecology has been put in place. A critical question remains: what priority is agroecology given? The 'business as usual' path is still given more weight, which can be seen in analysis of the level of investment and funding. This is a question of power structure.

The importance of natural capital also needs to be valued more. This does not necessarily mean putting a price tag to all ecological services, but to value it in a political sense and by other means and indicators. Farmers themselves need a more effective lobby in society as well as greater and fairer value given to their work, including an improved reputation. It is important to link the debate about healthy nutrition to healthy food systems; as well as make more visible how many families find their livelihoods in rural agricultural production.

In the Sustainable Development Goals (SDGs), the term agroecology is not used. Although not mentioned explicitly in any of the 17 goals, agroecological elements can be easily integrated in the indicators which will be used and the activities to come. Its principles should also be kept in mind for land governance reforms; secure tenure rights are key for smallholders' livelihoods, as well as for investments in soils.

To make research results relevant for farmers and policy-makers alike, balance between both perspectives is important. In the end, farmers take the decisions. Besides ensuring meaningful participation and influence by farmers, politicians could also be included right from the beginning as well as social movements. An important role for scientists could be serving as honest brokers. In so doing, they will need to feel passion for the views and realities of farmers and be at their side to follow up with them for extended periods. Action research, as experienced in Brazil, makes research much more relevant for smallholder farmers.

Communication and transparency also need to be increased, in order to reduce suspicion that the public now shows to scientists and along with this should also be increased transparency on how finances for science are linked to the increased objectivity of research systems.

Working Group 2: 'Climate and agriculture agendas: resource equality and people-smart agriculture'

Leisa Perch (Rio+ Centre) and Matheus A. Zanella (IASS)

During the past few years, the agricultural sector moved from a relatively neglected position towards the centre of climate change discussions, particularly finding how to adapt agricultural systems to increasing climatic changes. These have become suddenly amongst the main challenges in the sustainable development agenda.

Mainstream approaches to climate adaptation in agriculture have generally stressed technological solutions, such as improved crop varieties, climate-resilient agricultural practises and related policies to support their adoption. The working group discussed that adopting a technocratic approach to climate adaptation might provide some solutions, but should not be the only and the dominant approach.

Two main reasons illustrated this argument. First, it was apparent to the discussants that instead of old (e.g. simple fertilizer distribution) and new (e.g. no tillage) 'silver bullets,' there is need for integrated approaches that combine different types of knowledge. After all, technology carries political bias and terminology (how we frame the debate) matters and affects

particularly how and with whom we communicate. To have and keep diversity therefore seems crucial.

Second, discussants also highlighted that if solutions are not embedded in social and political processes, technologies run the risk of failing to integrate the three dimensions of sustainable development. One of the key points in this regard is the discussion about resource equality, in other words, how justice can be integrated into climate adaption thinking in a way that fundamental sources of vulnerability are addressed (such as unequal access to resources and opportunities).

This approach (during the discussions the group used the label 'climate and people-smart agriculture') was identified to accord with more recent and progressive understanding on the causes of food insecurity. That is, the view that food security is a multidimensional issue, representing much more than the need for increased agricultural production only (the availability dimension of food security concept). Food security has to necessarily address the issues of distributive and equitable access to resources (access dimension) as well as other issues that appeared more recently in the food security discourse (for example, food waste). Translating this to soil policy, there was a consensus that secured and equitable access to fertile soils resources must be an issue in the food security and soils agenda.

With regard to the nutritional aspect of food security, it was identified that keeping natural soil fertility was also an important strategy to support production of nutritious food (possibly relating to the utilization dimension). How these two interconnect, that is, how more precisely the maintenance of natural soil fertility, for instance by keeping agro-biological diversity in production systems (e.g. agroforestry systems, integrated crop rotation and pest management control) contributes to nutritious food still seems to be as aspect that should be better understood.

One additional remark addressed by participants was related to which governance structures are needed to continuously identify and respond to these challenges. One discussion point noted was the scale of decisions, that is, that while most agricultural practises that touch upon soils are conducted at the local level, its implications are global. The need to bridge local and global (glocal) became part of the mainstream discourse in sustainable development decades ago. Still how to make this an effective operating principle is still a very present-day challenge. Another point was the need to continuously seek governance structures that allow as many stakeholders as possible to analyse the situation and participate in decision-making (participatory, inclusive, bottom-up structures; there are many terminological examples that illustrate this point). Once again, the group identified that this is a huge challenge, where more focus is needed on the 'how' rather than the 'what.'

Finally, one point mentioned by many participants in different interventions as a decisive feature of people-centred climate-smart agriculture was the need for flexibility. "Be adaptive" and "keep diversity" were recurrent observations by the group. For example, this translates into flexible diverse agricultural research structures and pillars and similar flexibility in both public policy and civil action.

Conclusions and Follow-up

In the last part of the session, there was a brief reporting back from each of the groups to the plenary, leading to discussion about possible follow-up activities. Two suggestions emerged:
1. To keep, within the Global Soil Week working programme, a specific and dedicated

stream to further refine the connections between food security and soils in a comprehensive manner, instead of only addressing them as attachments to other topics. The session was one of the most attended of the event[2], which clearly indicates that there is a demand from 'Global Soil Week' participants to further advance discussion on agroecology, sustainable food systems and food security.

2. To initiate a process of elaborating a position paper on the connections between soils, sustainable food systems and food security. This document could instigate the discussions needed to formalize a position by IASS and partners on these issues. It was suggested that the organizers lead this process, but in consultation with some participants that expressed interest in participating by providing comments as well as other inputs.

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[2]75 persons with 95 % of participants staying from the beginning to the end; half of the Young Professionals were at this session, almost all in the Agroecology Working Group.

Book Review

Linda Olson (2014). How to Get Your Writing Published in Scholarly Journals. Guide to Academic and Scientific Publication. e academia. PRS Proofreading and Editing Service, Letchworth, UK, 126 pp. ISBN-10: 0992958806, ISBN-13: 978 – 0992958800.

A free e-copy is available at: **http://www.proof-reading-service.com/guide**

The printed version is available for £12.99 from Amazon:

http://www.amazon.co.uk/gp/product/0992958806?utm_source=Printed+Book&utm_campaign=0009179b94-Paperback+Version&utm_medium=e-mail&utm_term=0_9c2e3fe4de-0009179b94 – 103979965

This is a very useful book to guide authors and potential authors in their quest to publish their academic papers. The book is divided into three Parts:
Part I. What to Publish and Where to Publish It.
Part II. Preparing, Presenting and Polishing Your Work.
Part III. Communicating with Journal Editors: Submission, Acceptance, Revision and Rejection.

These three parts are divided into seven chapters and an appendix:
Chapter 1. Essential Ingredients for a Successful Academic or Scientific Article (pages 1 – 12).
Chapter 2. Targeting an Academic or Scientific Journal: The Right Paper in the Right Place (pages 13 – 21).
Chapter 3. Deciphering Journal Guidelines and Designing an Effective Presentation (pages 22 – 34).
Chapter 4. Journal Guidelines and Formal Scholarly English (pages 34 – 59).
Chapter 5. Presenting Data and Sources Accurately and Effectively (pages 60 – 89).
Chapter 6. First Things First: Earning the Interest and Respect of an Academic or Scientific Editor (pages 90 – 105).
Chapter 7. After Submission: Acceptance, Rejection and Revision (pages 106 – 120).
Appendix (pages 121 – 126).

The Book is rich in many 'common sense' tips and advice, but a short review cannot cover all of them. However, there are several points which particularly struck a chord with me.

1. A research paper must address three crucial elements. The research must be original, present significant results and propose meaningful arguments.
2. A paper should cover a significant body of work. Authors should not 'thin slice' their material to produce multiple papers; an activity sometimes referred to as 'salami slicing.'
3. The Book emphasizes the importance of carefully targeting the most appropriate journal.
4. The paper should strictly adhere to the format specified by the specific target journal.
5. It is essential the author pays full attention to the importance of consistency. I particularly like the mantra proposed on page 82 for authors in the process of drafting their paper: *"precision, precision, precision, consistency, consistency, consistency."*
6. The Book stresses the complexity of full, accurate and properly formatted citations and references and emphasizes the time-consuming nature of accurate, precise and consistent reference citation and formatting. Of course, to get into this habit as early as possible will save a great deal of time. Often Ph.D. students do not get into this habit and have to spend much time on checking and formatting references while writing-up stage of their theses.
7. The Book explores the intricacies of different citation formats (i.e. American Psychological Association (APA), Chicago, Harvard, Modern Language Association (MLA) and Vancouver).
8. I very much liked the emphasis placed on the importance of the paper title, abstract and key words as tools to effectively communicate the essence of the work, especially with editors and reviewers. The Book describes the main text of the paper as the "dinner" and the title, abstract and key words as the *"appetizers."*
9. In the Appendix, there are useful guidelines on how to format and phrase letters to journal editors, with two example letters.
10. Scattered within the Book, there are short text boxes containing helpful tips and advice.

Of course, writing academic papers is not an easy process. Perhaps with experience it does become easier. However, I do not think I have ever heard anyone describe it as an easy activity. Therefore, the Book does rightly emphasize the value of persistence and tenacity. Authors must be very determined and persist with their publishing ambitions. Two quotes encapsulate this advice:

"Let me tell the secret that has led me to my goal. My strength lies solely in my tenacity"
(Louis Pasteur, 1822 – 1895).

"Never give in. Never, never, never, never"
(Sir Winston Churchill, speech to Harrow School, UK, 29 October 1941).

The Book is a useful tool for all authors and potential authors at various stages in their publishing careers. The Book will be particularly helpful to researchers who have just embarked on their publication journey. These especially include Ph.D. students well advanced in their studies, recent Ph.D. graduates, Post-Doctoral Researchers and recently-appointed academics. However, academics further along in their career will also find the book useful as a 'refresher course' in the challenges and opportunities of academic publishing.

Book review by:
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The Newsletter and supporting Ph.D. research

Editor's note:

At the ESSC Council meeting in Lleida (Spain) in September 2006, the interactions between the ESSC and younger soil scientists were discussed (see Newsletter 2006/3, p. 5 – 8). It was decided that the ESSC should be more proactive in its support of younger scientists. As part of that initiative, we welcome articles from both Ph.D. researchers and supervisors. We would like to hear from recent Ph.D. graduates; what advice and experience do you have which you would like to share with your colleagues in earlier stages of their research? We would also like to hear from current Ph.D. researchers; what are the factors which both encourage and limit progress? What are the particular challenges facing part-time Ph.D. researchers? We also invite contributions from experienced Ph.D. supervisors. What experience would you like to share with less experienced colleagues? If you are a less experienced Ph.D. supervisor, what supervisory issues do you find challenging? In short, please tell us "what I know now, which I wish I knew then!"

Editor's note:

The citation details of Ph.D. theses by ESSC members since and including 2004 have been added as an additional page to the ESSC web site. To date, 52 Ph.D. theses are quoted. On the ESSC web site, please look under 'Publications.' Please forward the citation details of any additional Ph.D. thesis completed since the year 2000 by an ESSC member to any of the Editorial team. We will then add the thesis citation details to the web site.

Maria Fantappiè (2015). Elaboration and validation of models of the anthropic and climatic impact on Sicilian soil qualities, with particular attention to the soil organic carbon decline and soil erosion by water risks.

Ph.D. thesis, The University of Palermo (Italy), 87 pp.

Dipartimento di Scienze Agrarie e Forestali
Università di Palermo
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Soil organic carbon (SOC) decline and soil erosion by water are two of the most frequent soil threats in Sicily. But to what extent it is possible to counteract them, modifying the human activities, and particularly the agricultural ones? The aim of this Ph.D. thesis is the development and validation of models which could estimate the effect of the human activities in agriculture in relation to SOC contents and in relation to soil erosion by water in Sicily, considering also the climatic impact.

From the soil database of Sicily, 52 soil profiles were selected, situated in agricultural lands, cultivated with cereals on the hilly clayey pedo-landscapes of western Sicily, which were described, sampled and analysed for SOC content and nitrogen (N) content between 1995 – 2008. Furthermore, 22 soil profiles were sampled and analysed in 2013 and 2014 in the same pedo-landscapes. Analysis of the humic and fulvic fractions (HA+FA) of SOC was performed on 12 of these 22 soil profiles. All analytical data were from 0 – 40 cm soil depth.

An udomentric regime was determined for the 74 profiles, and an historical agronomic survey was performed in order to obtain information on agricultural practises used in the 74 soil sites during the years of sampling. The investigated practises were: soil tillage, fertilization treatments, crop rotations and irrigation. The variables N and HA+FA were normally distributed according to the Shapiro-Wilks W test, and the frequency distribution of SOC was not normal. To identify the variables with significant impacts on N and HA+FA, the statistical test used was the t-test, and it was the Mann-Whitney U test used for SOC. A Spearman Rank Order Correlation analysis was performed to analyse the inter-correlation of SOC, N and HA+FA. The SOC was transformed to its logarithm (natural base) and the transformed SOC_LN variable was normally distributed according to the Shapiro-Wilks W test. The whole effect of the udometric regime, land-use and the different categories of agricultural practises on SOC_LN, N and on HA_FA were statistically analysed through a Multiple Linear Step Wise Regression.

The Ph.D. research activity came to the conclusion that minimum tillage with cutting instruments, such as chisels or rippers, compared to traditional ploughing, either deep (>30 cm depth) or shallow (<30 cm depth), led to a significant increments in SOC, with a mean of 0.376 g/kg. Conversely deep ploughing, compared to shallow ploughing, had a significant

positive effect on total N content, with a mean equal to 0.284 g/kg. Fertilizing, either chemically, organically or a mixture of the two, led to a significant increment in SOC, compared to the no-fertilizer treatment. SOC was significantly positively correlated with N. Chemical fertilization had a significant negative effect on HA+FA.

Concerning soil erosion risk, the Ph.D. research activity progressed the calibration and validation of the USLE (Universal Soil Loss Equation) Model for the entire island of Sicily. Five formulae to estimate the USLE rainfall erosivity factor (R) on the basis of mean monthly and annual precipitation were compared with the true values of R factor derived from data from five meteorological stations distributed throughout Sicily. The most exact formula to calculate the R factor, for the Sicilian climate, with least Root Mean Squared Error, was that of Ferro *et al.* (1999). The soil erodibility factor (K) was mapped considering soil texture, SOC and the rock fragment cover of Sicilian topsoils, and considering the presence of volcanic soils, adopting the methods proposed by Stone and Hilborn (2012), Poesen *et al.* (1994) and Van der Knijff *et al.* (1999). The slope-length and slope gradient (LS) factors were derived from the Digital Terrain Model of Sicily, applying the formulae proposed by McCool *et al.* (1987, 1989). The map of potential soil erosion by water was obtained multiplying the R, K and LS factors. A value of Ep was attributed to each of 2,100 units of data showing absence of soil erosion by water collected from all of Sicily. The mean value of Ep was calculated for the corresponding land-uses, grouped into nine great groups: arable crop monocultures; arable crop associations; vineyards; shrub-lands and post-fire vegetation; olive groves, other orchards, eucalyptus plantations; hay and pastures; conifer woods; broadleaf and mixed woods and citrus trees. The soil cover protection (C) factors for the nine great groups of land-uses were calculated by dividing by 2 t ha^{-1} y^{-1}, which was taken as a mean rate of erosion not visible to the naked eye, with the mean Ep values calculated previously. Vineyards were the least protective land-use (C factor 0.542), followed by other orchards, arable crops, shrub-land, hay and pastures and finally woodlands. The map of soil protection (P) factor was derived by the map of terraced landscapes, with P equal to zero (complete soil protection) in the case of the presence of terraces. Finally, the map of soil erosion by water was obtained by multiplying the Ep map with the maps of C and P factors.

For the quantitative and qualitative validations, published data on measured soil erosion by water on three experimental stations in Sicily were collected, and the maps of soil erosion by water developed by the projects PESERA, USLE and MESALES of the EU Joint Research Centre (JRC). Qualitative validation was performed by calculating the Bayesian positive and negative predictabilities of our calibrated USLE map, in comparison with the maps of MESALES, PESERA and USLE of the JRC, on the basis of the 6,150 georeferenced units of true data of presence or absence of soil erosion by water. The results indicated that the map of soil erosion by water obtained with our calibrated USLE model was the best both for quantitative and qualitative validation, with a positive predictability of 81.5 % and a negative predictability of 61.0 %.

Publication

Fantappiè M., Priori, S. and Costantini, E.A.C. (2014). Soil erosion risk, Sicilian Region (1:250,000 scale). Journal of Maps, DOI: 10.1080/17445647.2014.956349

Acknowledgements

The author thanks the ESSC for awarding me the 'Young Person's Award 2015' in recognition of my *"outstanding contributions to soil conservation and protection in Europe."* Special thanks go to Professor Carmelo Dazzi for co-ordinating the Ph.D. course on Environmental Agronomy at the University of Palermo. I also thank Dr Giuseppe Lo Papa and Dr Edoardo Costantini, both whom assisted me during my research activities and in the preparation of my Ph.D. thesis.

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Recent Publications by ESSC Members

Included are the citation details of papers and books produced by ESSC members. These provide a growing resource for exchange of valuable information to both research and teaching. The cumulative citation list is being added to and updated on the ESSC web site. Students of ESSC members (both undergraduate and postgraduate) are increasingly accessing this facility in their literature searches. Currently, the number of quoted publications cited on the web page is 721. Please e-mail the citation details of papers in international refereed journals since and including the year 2000 to any member of the Editorial team.

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Andrenelli, M.C., Magini, S., Pellegrini, S., Perria, R., Vignozzi, N. and Costantini, E.A.C. (2013). The use of the ARP© system to reduce the costs of soil survey for precision viticulture. **Journal of Applied Geophysics** 99, 24 – 34. DOI: 10.1016/j.jappgeo.2013.09.012

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Web Based Bulletin Board

The ESSC wishes to rapidly disseminate information to its members. Please forward information to the ESSC web site to be placed on our ESSC Bulletin Board. These could include searches for potential collaborators for research proposals, calls for research proposals, job opportunities, research studentship opportunities, impending conferences and other items of important information for rapid dissemination. Of course, we will also continue the regular circulation of information via our Newsletter.

The NEW ESSC web site is:

http://www.soilconservation.eu/index.html

ESSC membership list and contact details

The full ESSC membership list is held on the ESSC web site. Under 'members' you can obtain a full listing. Also under 'members' you can click on any member country and find a listing of members in the selected country.

We are trying to keep the membership list on the web site up-to-date. Please check your details and let us know if there are any necessary correction(s). If your details change, also please let us know. Some members have requested that we do not add their e-mail addresses to the web site, to avoid uninvited 'spam' e-mails. Of course, we respect this request. Therefore, while we retain a list of the e-mail addresses of ESSC members, this list will not be available on the web site.

Editorial matters in Bratislava are handled by Ing Karol Végh. In terms of membership lists, contact details and the ESSC web site, please send updated information to Karol at:

E-mail: **kajove@gmail.com**

Please also use and refer to the 'Directory of European Organizations and Persons Working on Soil Protection' as a reference source for European colleagues, both members and non-members of the ESSC. This publication contains the e-mail addresses of most ESSC members and will be subject to periodic updates. The reference citation is:

Rubio, J.L., Imeson, A.C., Bielek, P., Fullen, M.A., Pascual, J.A., Andreu, V., Recatala, L. and Ano, C. (2006). Directory of European Organizations and Persons Working on Soil Protection. Soil Science and Conservation Research Institute, Bratislava, 190 pp. (plus CD-Rom).

This publication is available as a pdf document on the 'Publications Archive' on the ESSC web site.

European Society of Soil Conservation
Babeş-Bolyay University Cluj Napoca
University of Agricultural Sciences and Veterinary Medicine Cluj Napoca
Office for Pedologic and Agrochemical Studies Cluj-Napoca

ESSC International Conference 'Soil – Our Common Future'
Cluj-Napoca (Romania), 15 – 18 June 2016

Welcome Message

Dear Colleagues

Babeş Bolyai University (BBU), the University of Agricultural Sciences and Veterinary Medicine (UASMV) and the Office for Pedologic and Agrochemical Studies (OPAS) from Cluj Napoca are glad to announce the great honour and important scientific challenge for us to organize the 'ESSC International Conference' at Cluj Napoca, Romania, between 15 – 18 June 2016. Following the great success of former ESSC conferences and congresses, scientists from all over the world are invited to participate in this Conference. The main topic of the Conference **'Soil – Our Common Future'** is the vital interconnection between soil on one the one hand and humans, animals and plants on the other hand. Thus, the scientific programme covers the main research areas regarding soil science and related fields.

We look forward to meeting you in Cluj Napoca (Romania) and we are sure that the ESSC Conference will be an excellent opportunity to prove that science and scientists are prepared to face present and future challenges, where the soil is a crucial component.
Reader dr. Nicolae HAR
Head of the Department of Geology
Babeş-Bolyai University, Cluj Napoca.

Registration and payments (€)

	Early Registration (Before/On 30 April 2016) (€)	Regular Registration (Before/On 1 June 2016) (€)	Late Registration (After 1 June 2016) (€)
Regular participant	250	300	350
Students / PhD student*	100	125	150
Accompanying Person	100	150	175
Gala Dinner	50	60	70
Publication of additional abstract	25	25	25
Field trip	50	60	70
*Students must upload their current student certificate to the registration system.			

The registration fee includes:

Regular participants, students and PhD students:

- Welcome Cocktail at the venue on Wednesday 15 June 2016.
- Access to the opening and closing ceremony.
- Admission to all scientific sessions.
- Publication of one abstract in the Book of Abstracts.
- Congress materials (Conference bag, Name badge, Printed programme, Book of Abstracts).
- Coffee breaks at the Conference venue.
- A certificate of attendance.

Accompanying persons:

- Welcome Cocktail at the venue on Wednesday 15 June 2016.
- Admission to all scientific sessions.
- Coffee breaks at the Conference venue.

The registration fee does not cover hotel accomodation in Cluj.

Registration fee cancellation policy:

- Cancellation before 30 April 2016: 80% of paid sum will be refunded.
- Cancellation from 30 April 2016 to 1 June 2016: 50% of paid sum will be refunded.
- Cancellation after 1 June 1 2016: there will be no refund.
- All refunds will be made within two weeks after the end of the Conference.

Deadlines:

1 November 2015	Registration	Start of online registration
1 November 2015	Abstract submission	Start of abstract submission
31 January 2016	Abstract submission	Deadline of abstract submission
1 March 2016	Abstract submission	Confirmation of acceptance and inclusion of abstracts in the scientific programme of the Conference
30 April 2016	Registration fees	Deadline for early registration fee payment
30 April 2016	Registration fees	Deadline for cancellation of participation with 80% refund of the registration fee paid (except bank charges)
1 June 2016	Registration fees	Deadline for regular registration fee payment
1 June 2016	Registration fees	Deadline for cancellation of participation with 50 % refund of the registration fee paid (except bank charges)
1 June 2016	Registration fees	After this date, fees will not be refunded
1 June 2016	Field trip	Deadline for booking and payment of excursions

Scientific Sessions

The scientific topics of the 8th ESSC Congress are organized into the following main sessions:

1. Desertification and food security.
2. Organic soils, protection and conservation.
3. Management of soil functions: monitoring and remediation.
4. Post-fire soil management after natural and anthropogenic fires.
5. Urban soils: technical evaluation and engineering.
6. Soil conservation issues in organic farming and conservation agriculture.
7. Forest soils: conservation policies.
8. Land management in a changing environment.
9. Soil quality improvement using natural materials.
10. Climate-smart agriculture: modelling and prediction.
11. Pedotechniques in large scale farming.
12. Remediation of mine, quarry and oil field soils.

Conference Secretariat:

Babeş-Bolyai University Cluj-Napoca, Mihail Kogalniceanu Str, no. 1, 400084, Cluj-Napoca, Romania
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Office for Pedologic and Agrochemical Studies Cluj-Napoca, Fagului Street, no. 1, 400483, Cluj-Napoca, Romania
Dr Horea CACOVEAN, e-mail: turda75@yahoo.com

Accommodation

Cluj Napoca has numerous 3 to 5 stars hotels. A map of the hotels locations and a list with contact details will be soon available soon on the Conference website.

Contact

Web: **http://essc2016.conference.ubbcluj.ro/**

E-mail: **essc-congress2016@yahoo.com**

GRANTS
For young researchers who wish to attend the 8th ESSC International Conference on:

'Soil – Our Common Future'
Cluj-Napoca (Romania), 15-18 June 2016

The ESSC will provide TWO grants of €500 Euro each to TWO young researchers (less than 35 years old) who are members of the ESSC. The grants will support their participation in this ESSC International Conference.

To apply for a grant just fill in the following grant application form and send it by e-mail to the President and to the Secretary of the ESSC (**carmelo.dazzi@unipa.it**; **edoardo.costantini@entecra.it**) no later than 15 January 2016 together with:

1. An extended abstract of the paper that the applicant wishes to present at the Conference (four pages with: Introduction; Materials and Methods; Results; Conclusions; Keywords).
2. A short curriculum vitae of the applicant.
3. A letter of recommendation from the Institution/Department of the applicant.

An *ad hoc* ESSC Commission will evaluate the grants requests. Applicants will be notified of the Commission's decision by 31 March 2016.

ESSC GRANT APPLICATION FORM

NAME	
SURNAME	
PLACE OF BIRTH	
DATE OF BIRTH	
NATIONALITY	
INSTITUTION	
ADDRESS	
Presentation (oral/poster)	
Title of presentation	

Please note that the membership subscription can be submitted at the same time as the grant application.

Articles, reports, letters, views or comments on any aspect of soil erosion and conservation in Europe are always welcome.

We invite proposals for special thematic issues of the Newsletter. We also welcome any comments on the ESSC Newsletter and suggestions on how it can be improved and developed.

Do not forget to send in your details of the following information:

(i) Reviews of recent conferences.
(ii) Recent grant awards.
(iii) The citation details and abstracts of completed Ph.D. and M.Sc. theses.
(iv) Newly enrolled Ph.D. research students, title of their research topic and names of research supervisors.
(v) Recent staff institutional movements/promotions.
(vi) A reference list of your 'new' international refereed scientific journal papers, which have been published recently (since and including the year 2000).
(vii) At the ESSC Council at Průhonice (Czech Republic) in June 2009, it was agreed that the Newsletter will present a series of national reports on soil erosion and soil conservation activities in individual European countries. If you would like to volunteer a contribution, please contact any member of the Editorial team.

Send these details to either:
Professor Mike Fullen: **m.fullen@wlv.ac.uk**
or
Dr Colin Booth: **colin.booth@uwe.ac.uk**

and they will include this information in the next issue.

PLEASE NOTE:
We publish two Newsletter issues per year. The deadlines are:
1 March and 1 September.

The following four verses are a selection of translated ancient songs (ballads) of the Hani minority people of Yuanyang, Yunnan Province, south-west China. The Hani are world-famous as the builders and guardians of the rice terraces of Yuanyang (Plate 1). Until recently, the Hani had no written language. These ballads were collated by Hongzhen Zhang, based on meetings with the Mopi (elders of the Hani). The verses were abstracted from:

Hongzhen Zhang (2010). Interpretations of the Hani Seasonal Production Ballads. Yunnan Press Group Company and Yunnan Art Press Company, Kunming, 248 pp. (ISBN 978-7-5489-0034-4).

Plate 1: *The distinctive 'mushroom houses' of the Hani minority in Qingkou village, Yuanyang. Rice straw provides the 'thatch' (roofing materials). Photo taken by Mike Fullen (Wolverhampton, UK) on 12 November 2010.*

II. On the Arrival of the Three Months of Spring

Verse 164

After three days,
The buckwheat blossoms like the way of sesame,
And fruit like Xibi tree branch.
If men work hard in cultivating buckwheat fields,
And the women sow carefully,

They can get in their own food.
In the barren months,
Buckwheat is the lifesaving goods.
We should remember by heart,
Which field we can get a bumper harvest.

With the saw in the right hand,
The women scalpel the buckwheat very quickly,
And the men engage in thrashing tirelessly.

❧

Verse 166

With a basket in the right hand,
And three ropes in the left hand;
With a good looking pocket,
Everyone works in the field in co-operation;
With buckwheat on the shoulder,
they walk firmly
As busy as yellow-footed bees collecting honey.

Under the chestnut tree,
The horse caravan takes a break,
And the farmers with heavy loads have a rest there.

❧

Verse 168

Find a proper place to relax from the load,
And shade to cool off.
Pick up leaves from the tree,
The pair of lovers sit on them with happiness.

Do not pick up the leaves down the road,
Since dirt on them may blur our clothes,
Do pick up leaves up the road,
The more they sit on them, the more they fall in love with each other.

Do not pick up the lowest leaf,
Since it is used to keep off the wind;
Do not pick up the highest leaf,
Since it is used to keep out the dew;
The lovers pick up the middle leaves and sit on them.

❧

Verse 172

Time flies very fast,
We find ropes to fasten domestic animals,
But no one can find a rope to stop the movement of the sun.
Tired though the buffaloes are, they relax in the stall.
The deer may suffer a lot before they return to their nest.

We are going back home after tiresome work,
Like the buffaloes and the deer.

When the girlfriend is so tired,
The boyfriend is always ready to help.
Hurry up! Walking fast does not hurt your toes,
We are busy walking just like the yellow-footed bees picking dew.

Thanks to Professor Li Yong Mei (Yunnan Agricultural University, P.R. China) and Professor Wang Weiguang (The University of Wolverhampton, UK) for their editorial help with the Hani ballads.

Camaldulensis

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River red gum (*Eucalyptus camaldulensis*) is the most widespread eucalypt in Australia, occurring in all mainland states of Australia. A similar-looking species, forest red gum (*Eucalyptus tereticornis*), extends from the south-east corner of Victoria State to southern Papua New Guinea. In my home state of Victoria, river red gum grows widely around the capital, Melbourne, lines most major rivers, and beautiful ancient trees at least several hundred years old are still common across the basaltic plains of western Victoria. These grow in savannah grasslands, especially where the characteristic heavy soils have received silt or wind-blown sand. The heavy and durable timber was formerly used for heavy construction, fencing and railway sleepers, and still is sold for fuel.

I wrote this poem several years ago, after much thought and frequent observations as a forester working on farms. Entitled CAMALDULENSIS, it alludes to the origin of the botanical name. The species was long dubbed *Eucalyptus rostrata* after its rostrate operculum, the little Noddy-cap formed by the fused sepals and petals; with eucalypts the spectacular floral displays are due to the prominent stamens. Research, however, eventually showed that the first specimen described had been collected in 1832 from a private garden near Camaldoli Monastery outside Naples, hence the change of name.

Red gum savannahs once so vast
For millennia their shadows cast
Across the tribal hunting grounds
Amid a feast of primeval sounds

Trunks columnar, mottled grey
Legions anchored in sandy clay
Canopies a dappled green
Seasonally a flowery mien

Plate 1: *Red gum (Eucalyptus camaldulensis) trees in Victoria, Australia (photo by Ian Lunt).*

Branches shed from time to time
Leaving cavities – shelter prime
For mammals, birds and bats
And marauding goannas and rats
Those branches drying, strewn
For decades perhaps, until consumed
By friendly fires of Koorie camps
Allaying hunger, cold and damp

Harbouring insects by the swarm
Myriad organisms were the norm
Under the bark, munching greenery
Part of the ecological scenery!

And relentless fungi and ants and more
Attacked the red gum's woody core
Fifty to a hundred decades thus

Ashes to ashes and dust to dust…The big'uns
dropped seed continually
A seedling survived, became a tree
One in a million, maybe less
Died a veteran – as for the rest
Grazed by 'roos or burnt by fires
Lightning or hunter lit the pyres
Of numberless seedlings that disappeared
Unfulfilled, year by year

The survivors dominated the plains
At home in drought or heavy rain
Responding as the climates changed
Subtly extending or shrinking range
Gariwerd outwash, volcanic fumes
Lakes and swamps and lunette dunes
Lava flows and sands windblown
Megafauna – wombats overgrown!

Scores of millennia pass
Ecosystems of gums and grass
Another change – along came Man
And his ability to clan and plan
Stalk the emu, harvest yams
Corangamite, Tarrayoukyan
Canoe scar a Koorie rune
Campfire sagas under the moon

Ochre pits, and stone-axe blaze
Then Mitchell and the bullock drays
*Longboats on **his** Glenelg River*
Mount William's winds made riders quiver
Two hundred years with us around
Settlers needed the red gums' ground
For sheep and crops and living space
We cleared them at a rollicking pace

So much waste!
What shocking haste!
Insensitive to their age and grace
Bloody base!
Mortised for a post-and-rail
Split and interlocked at Harrow gaol
And the shearing shed at Kout Narin
Gossamer fleece and shearers lean

Fence posts, light-rail sleepers
It's our land now! Finders keepers!
Today the timber's appreciated
Boutique floorboards, balustraded
A glorious russet-coloured timber
From Kimberley to Mirrimbah
Australia's most widespread tree
Symbol of our superb country

Is it the most Antipodean tree?
Yet there is an irony...
camaldulensis, botanists call this plant
Referring to a locale distant
Camaldule's a monastery in Italia...
Not a farming district in Australia!
Who cares? So what!
We must protect, extend the trees we've got!

I trust my grandkids, as is my bent
Can delight in red gums ancient
Can sense their venerability
Their strength and complex poetry

Scattered still across the landscape
West wind skews their Lego shape
Outer branchlets dying back
A dead-end-road? Red Gum Track!

As a boy with crosscut saw I stood
Helping Dad cut winter's wood
I took each block and backed it off
Cross-grained red gum isn't soft!
Now I work with Landcare squads
Is it the twilight of the gods?
Or can we massively regenerate
The finest tree of the Garden State?

From: Rob Youl (2015) Old Father Rhyme. Poems Loved over a Lifetime. Polybractea Press, South Melbourne (Australia), 50 pp.

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"Without the work of this humble creature, who knows nothing of the benefits he confers upon mankind, agriculture, as we know it, would be very difficult, if not wholly impossible"

(Charles Darwin FRS, commentary on earthworms, 1881).

"One generation plants the trees; another gets the shade"

(Chinese proverb).

"In every seed is the promise of thousands of forests. But the seed must not be hoarded; it must give its intelligence to the fertile ground. Through its giving, its unseen energy flows into material manifestation"

(Deepak Chopra, 1996).

"The best career advice to give to the young is, "find out what you like doing best and get someone to pay you for doing it"

(Katherine Whitehorn).

AIMS OF THE SOCIETY

The ESSC is an interdisciplinary, non-political association, which is dedicated to investigating and realizing soil conservation in Europe. The ESSC pursues its aims in the scientific, educational and applied sectors by:

Supporting investigations on soil degradation, soil erosion and soil conservation in Europe.

Informing the public about major questions of soil conservation in Europe.

Collaborating with institutions and persons involved in practical conservation work in Europe.

The ESSC aims at co-ordinating the efforts of all parties involved in the above cited subjects: research institutions; teachers and students of geosciences, agriculture and ecology; farmers; agricultural planning and advisory boards; industries and government institutions.

ZWECK DER VEREINIGUNG

Die ESSC ist einer interdisziplinäre, nicht politische Vereinigung. Ihr Ziel ist die Erforschung und Durchführung des Schutzes der Böden in Europa. Die ESSC verfolgt dieses Ziel auf wissenschaftlichem, erzieherischen und angewandtem Gebiet:

Durch Unterstützung der Forschung auf den Gebieten der Boden-Degradierung, der Bodenerosion und des Bodenschutzes in Europa.

Durch Information der Öffenlichkeit über wichtige Fragen des Bodenschutzes in Europa.

Durch Zusammenarbeit mit Institutionen und Personen, die an der Praxis des Bodenschutzes in Europa beteiligt sind.

Die ESSC will alle Personen und Institutionen zusammenführen, die sich für die genannten Ziele einsetzen: Forschungsinstitutionen, Lehrer und Studenten der Geowissenschaften, der Landwirtschaftswissenschaften und der Ökologie, Bauern, landwirtschaftliche Planungs- und Beratungsstellen, Industrieunternehmen und Einrichtungen der öffentlichen Hand.

BUTS DE L'ASSOCIATION

L'ESSC est une association interdisciplinaire et non politique. Le but de l'association est la recherche et les réalisations concernant la conservation du sol en Europe. L'ESSC poursuit cette finalité dans les domaines de la recherche scientifique, de l'éducation et de l'application:

En encourageant la recherche sur la dégradation, l'érosion et la conservation du sol en Europe.

En informant le public des problemes majeurs de la conservation du sol en Europe.

Par la collaboration avec des institutions et des personnes impliquées dans la pratique de la conservation du sol en Europe.

L'ESSC souhaite favoriser la collaboration de toutes les personnes et institutions poursuivant les buts définis ci-dessus, en particulier: institutions de recherche, professeurs et étudiants en géosciences, des agriculteurs, des institutions de planification et des conseil agricole, de l'industrie, et des institutions gouvernementales.

OBJECTIVOS DE LA SOCIEDAD

La ESSC es una asociación interdisciplinar, no-politica, dedicada a la investigación y a la realización de acciones orientadas a la conservación del suelo en Europa. La ESSC persigue sus objectivos en los sectores cientificos, educacionales y aplicados, en al ámbito europeo:

Promocionando la investigación sobre degradación, erosión y conservación de suelos.

Informanto al público sobre los principales aspectos de conservación de suelos.

Colaborando con instituciones y personas implicadas en la práctica de la conservación de suelos.

La ESSC aspira a coordinar los esfuerzos, en los temas arriba mencionados, de todas las partes implicadas: centros de investigación, profesores y estudiantes de geo-ciencias, agricultura, selvicultura y ecología, agricultores, servicios de extensión agraria, industrias e instituciones gubernamentales.

Visit the ESSC Website: http://www.soilconservation.eu

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