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3/2010

ESSC EUROPEAN SOCIETY for SOIL CONSERVATION

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Cover photo: Desertified land in the Province of Almería, south-east Spain (photo from Alfonso Sevilla, Almería, Spain).

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This issue of the ESSC Newsletter presents the 14th 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 Ildefonso Pla Sentis (Lleida, Spain). Eventually, we envisage this collection of essays developing into an authoritative book.

Progress and setbacks in soil conservation research: challenges for the future

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Introduction

Soil is a vast reservoir for life, and controls global geochemical cycles. The biophysical functions of the soil are fundamental for the maintenance of the integrity and health of the environment. Therefore, the soil is fundamental to the needs of human life, and plays a central role in determining the quality of our environment. In the future the role of soils in some crucial aspects for human life, such as food production, hydrological cycles and air composition, will progressively increase. To protect these functions we must evaluate and predict the behaviour of soils in time and space under a wide range of both agricultural and non-agricultural land uses, in relation to crop production, water supply and environmental quality.

Increased human influences on soils, both through the expansion and intensification of agricultural activities with inappropriate land management practises, and growth in the number and size of populated areas, frequently result in widespread processes of land and soil degradation, and increased production of domestic and industrial wastes (Plate 1). Associated with land and soil degradation there is a decrease in available good quality water for agriculture, urban and industrial needs, and decreased biodiversity. Based mainly on land and soil degradation, and associated hydrological changes, there are increased risks and problems of dryness, leading to desertification, and of 'natural' disasters, such as droughts, flooding, landslides and mass sedimentation (Plate 2). Changes in soil cover and soil degradation will influence global climatic changes.

Soils play a crucial role in the hydrological cycle. Soils form the main reservoir of fresh water, and transform discontinuous and often erratic rainfall inputs into a continuous supply of water to plant roots and continuous discharges of water to groundwater, streams and rivers. Hydrological processes determine the transport of water soluble materials and pollutants, both naturally-occurring and human-derived. Naturally occurring constituents within the soil are mobilized and transported as a result of infiltration and flow of rainfall and irrigation water. Pollutants are partially retained, released and transformed in the soil before

reaching groundwater. Therefore, the quality of water resources is greatly influenced by soil hydrological processes. Continuing shrinkage of quality water supplies for different uses (i.e. human consumption and irrigation) highlights the importance of water conservation. An integrated approach to the use, management and conservation of soil and water resources is further justified by the close relationship between soil and water quantity and quality (Plate 3).

The processes of soil and water degradation are closely linked through unfavourable alterations in the hydrological processes determining soil water regimes. They are also influenced both by climatic conditions and the use and management of soil and water resources. Although the close interaction between the conservation of soil and water resources is increasingly accepted, they are still usually evaluated separately, and consequently the prediction and prevention of the effects derived from their degradation are often inadequate. This will become more important under the projected effects of global climatic changes, which will mainly affect hydrological processes on the land surface, mostly related to the field water balance (Figure 1).

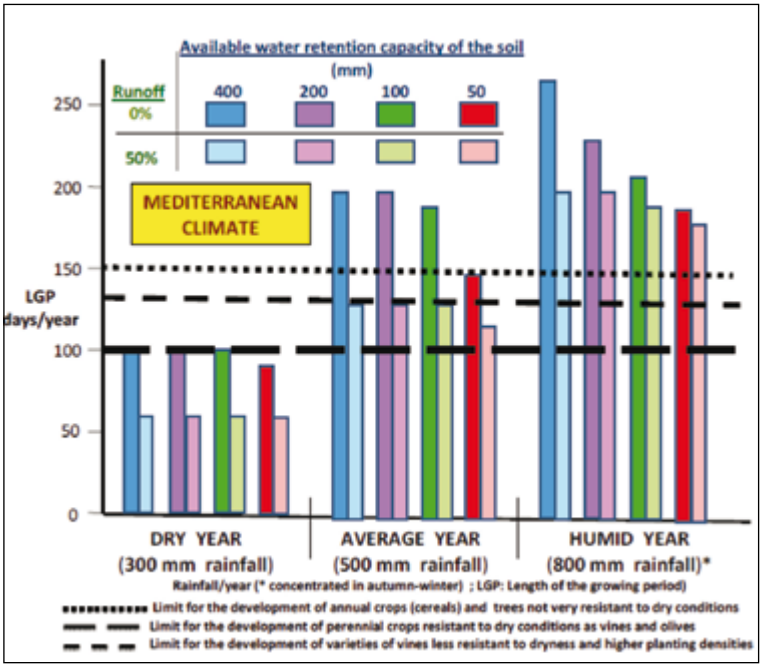

Figure 1. Potential length of the growing period in days/year (LGP) under semi-arid Mediterranean climatic conditions, as affected by the main critical factors derived from climatic changes, land use, management and soil degradation.

There is clear evidence that the degradation of soil and water resources at global, regional and local scales has been steadily increasing in recent decades, especially since the

1950s. This degradation is mainly due to the increased world population and socio-economic and technological developments, with increasing requirements for food, water and energy. In the last 15-20 years there has been increased interest in human-induced climatic change, associated with increased atmospheric concentrations of greenhouse gases. With no well defined cause-effect relationships, most of the present and future problems of land and soil degradation, water supply and natural disasters (i.e. droughts, flooding and landslides) are mainly attributed to these climate changes. At the same time, and probably related to it, there has been change in the foci of studies and research on soil and water conservation.

Evolution of soil conservation research

With the increasing evidence of the growing global problems of land, soil and water degradation and their effects on food production and the environment, there was increasing interest, especially since the late 1960s, in stimulating studies related to soil and water conservation. Particular attention was paid to the processes of soil and water degradation in relation to their use and management for agricultural purposes. This was a great change from the previous emphasis on more static studies of the characteristics of the soil resource, mainly for soil classification and mapping, and for land evaluation related to agricultural and other uses. Among the new studies and approaches related to soil and water conservation, one must especially recognize those developed in specialized research centres on soil erosion and soil salinization in the USA. These efforts led to the development of the USLE (USDA-ARS 1965; Wischmeier and Smith, 1978) to predict soil erosion and to systems for evaluating and predicting risks of soil and water salinization (USDA, 1954). Such models and evaluation systems mainly used empirical approaches, based on statistical relations between accumulated information of the contributory factors (climate, soils and water) and their observed or measured effects on soil degradation processes under very specific conditions. Therefore, the evaluation or predictive capacity of such models and systems could only be effective under similar conditions (climate, soils, topography and management) as their provenance.

Although those approaches were crucial initial contributions to the understanding of soil and water degradation processes, and to the application of some standardized conservation measures, later studies and research investigated the dynamic processes involved in soil and water degradation under different conditions. These studies demonstrated the limitations of the generalized universal use of these empirical approaches. Revisions or additions have been introduced more recently to these approaches (Renard *et al.,* 1991; Ayres and Wescot, 1985, 1987) with the intended purpose of solving some of the original limitations. The more recent development of alternative non-empirical models for the evaluation of soil erosion risks, like EUROSEM, have attempted to include very detailed descriptions of most factors involved in surface erosion processes, but generally they do not adequately consider related hydrological processes. Furthermore, the requirement for very detailed and accurate databases, which are usually unavailable, limits their application.

Concurrently with the renewed interest associated with soil and water conservation, there was an increase in related congresses and conferences. In addition, several international scientific organizations were initiated (SWCS: Soil and Water Conservation Society, ISCO: International Soil Conservation Organization, WASWAC: World Association for Soil and Water Conservation, ESSC: European Society for Soil Conservation) and Commissions and Sub-commissions on Saline Soils, Soil Conservation and Environment and Soil and Water Conservation within the International Society of Soil Science (now the International Union

of Soil Science). Simultaneously, under the direction of UNEP-ISRIC, there was a 'Global Assessment of Human-Induced Soil Degradation' (GLASOD) prior to the United Nations Conference on Environment and Development (UNCED) in 1992. This elaborated Agenda 21, a global programme for sustainable development. Several international conventions and programmes were created in association with GLASOD. These include UNCED (United Nations Convention to Combat Desertification), UNFCCC (United Nations Framework Convention on Climate Change), LADA (Land Degradation on Dry Lands) and WOCAT (World Overview of Conservation Approaches and Technologies).

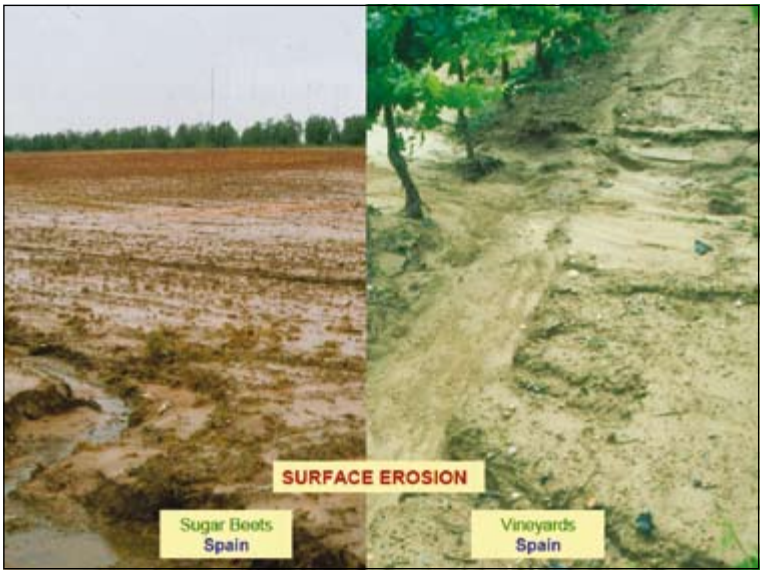

Plate 1. Surface erosion on a sugar beet field and vineyard in Spain.

GLASOD was a consequence of the need to evaluate the actual and potential problems of soil degradation at the global scale to provide international organizations with general overviews of the importance, extent and nature of the problems. The hope was that it would lead to increasing support to research and development activities focusing on prevention and control. This has not been the case, at least at the required level, and therefore, even today, these assessments are often used as a basis for discussing soil degradation problems at global, national and regional levels. Of course, due to the limitations of GLASOD, such information usually cannot be used for planning or defining strategies for soil and water conservation at any level. During the progress of GLASOD, the paucity of basic information on soil and land degradation was realized. Further information is required for adequate planning and effective application of practises to prevent soil and water degradation. In many cases the paucity of information was such that assessments were mainly based on personal information or the opinions of local 'experts.' For objective assessments improved quantitative ground evaluations and measurements are needed.

The more recent conventions and programmes at international and regional levels

are generally based on re-interpretations and different processing or representation of old information, sometimes using 'new' terminology. In other cases, new information has been mostly generated through indirect or remote sensing deductions, usually without adequate ground-truthing. Many past international assistance projects addressing soil conservation in developing countries have failed to reach their objectives, mainly due to deficient appropriate information at the local scale and the use of empirical applications of experiences obtained under very different biophysical and socio-economic conditions, without adequate local validation. In some cases, such assistance programmes incorporated inappropriate sophisticated equipment for laboratory or field measurements. Therefore, it is common experience that such programmes have no continuity and the equipment becomes disfunctional once the temporary technical assistance ceases.

Plate 2. Mass movements in Mexico and Columbia

In recent decades, with the increasing evidence of the central role of soils in our environment and realizing that the welfare and survival of our species in the coming centuries is intimately connected to soils, there has been an increasing interest in soil conservation across multiple disciplines. Although, in principle, this situation could benefit the required interdisciplinary approach to the problems of human-induced soil degradation, in reality it has led to a very specialized and isolated consideration of different aspects related to the degradation of soil functions. These problems frequently result in over-simplifications, failures and even contradictions in the proposed strategies to control soil degradation. This is also due to the decreasing public and private support for more integrated interdisciplinary studies. Simultaneously, this lack of support could also be due to the failure of researchers to demonstrate the role of soils and the requirement of those interdisciplinary studies to achieve sustainable future development at multiple spatial scales. Related to this, it is surprising how many of the increasing frequent and damaging 'natural' disasters (i.e. catastrophic landslides

and floods) are solely attributed to factors related with global climatic changes, when usually the main cause is associated with previous changes in land use and management leading to soil degradation processes.

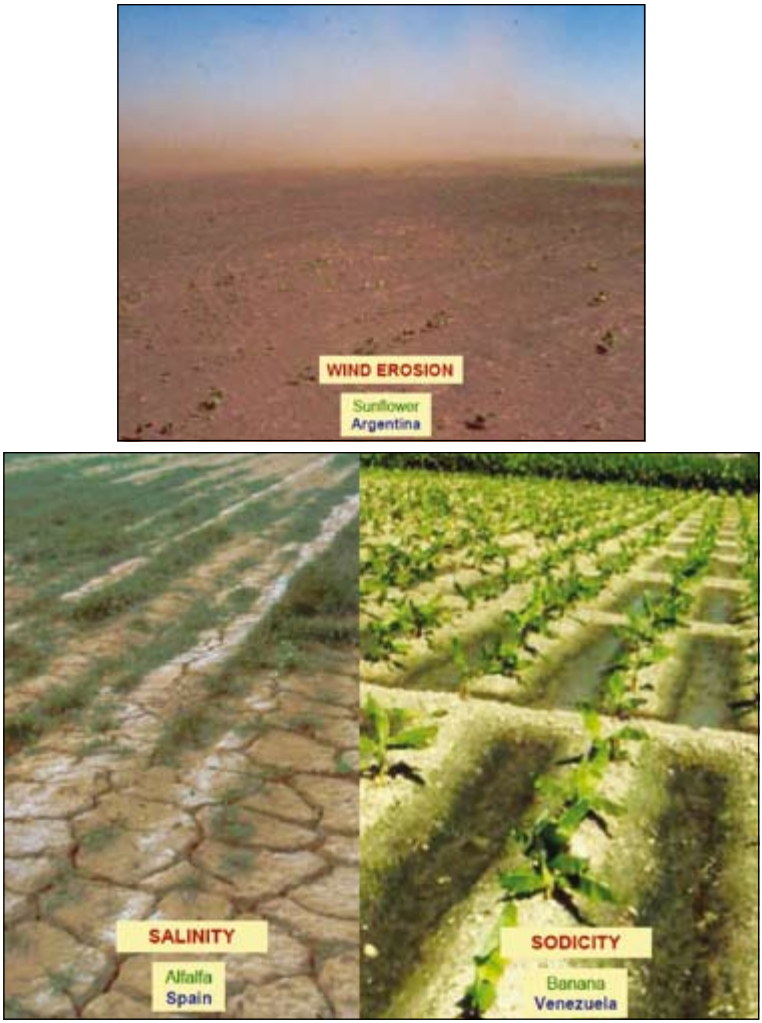

Plate 3. Examples of wind erosion (Argentina), salinization (Spain) and sodification (Venezuala).

Stagnation and clichés in soil conservation research

Currently, we have reached quasi-stagnation in soil conservation research and a new series of soil conservation terms and clichés have been introduced. These are derived from different interests, but generally they are very empirical approaches without a strong

Plate 4. Examples of desertification in the Canary Islands (Spain).

Plate 5. Examples of surface level changes in Spain.

scientific basis. Some of them like 'soil quality' and 'desertification' lack precise quantifiable meaning. However, they attract increased attention from organizations setting policies and providing funds for soil and water conservation research (Plate 4). Regretfully, these approaches have not increased the required studies or developed adequate measures to prevent or correct specific problems of soil and water degradation, and their effects. Related to this, there has been a tendency to increasingly rely on qualitative data and concepts based on expert judgments, such as indices of soil quality. These have very limited accuracy and are insufficient for developing adequate policies for land use management.

The term 'desertification' was introduced to emphasize the problem of extreme land degradation. Adoption of the term has led to confusion between what is a natural process exclusively due to climate factors, and what is human-induced through changes in land cover, use and management. It also distracted resources from the study and control of such extreme conditions, when from socio-economic and environmental perspectives there could be more important levels of land and soil degradation on more productive lands in more humid climates.

The introduced 'new' processes of soil erosion like 'tillage erosion' and 'land levelling erosion,' which are simply mechanical soil displacements controlled by human actions, have nothing in common with traditional water erosion (surface or mass erosion) related to hydrological processes, and wind erosion processes, derived from mainly uncontrolled natural phenomena (Plate 5). Besides artificially 'increasing' the areas affected by erosion in some regions, the introduction of these 'new erosion processes' have created further confusion and weakening of the research efforts related to the 'traditional' more complex soil erosion processes, where the interaction between soil and water is fundamental (Figures 2 and 3).

Plate 6. Organic topsoil in the highlands of Ecuador.

Among the new clichés associated with soil and water conservation, the more commonly considered are 'carbon-sequestration' and 'zero tillage.' 'C-sequestration' refers to the retention of C in soil organic matter (Plate 6). The potential of influencing levels of the greenhouse gas CO_2 in the atmosphere has led to disproportionate research into the accumulation of organic matter in soil. This has become a dominant paradigm, without due consideration of the other beneficial or detrimental effects of such accumulation for various environmental and productive soil functions. There are also contradictions between the objective to increase 'C sequestration' to control anthropogenic climate change and the proposed future use of most crop residues to produce biofuel (ethanol), also to influence climate change through decreasing net emissions of CO_2 to the atmosphere.

The management of agricultural lands under 'zero tillage' practises has been empirically proposed and generally accepted by many (as a cliché or quasi-dogma) as the universal recommended soil conservation practise to control soil erosion and to control anthropogenic climatic change through increased C-sequestration, under any conditions (Plate 7). Without due consideration and research on the effects of such management under different combinations of soils, climate, drainage, crops and herbicide use, the projected beneficial effects could not be achieved. In some cases it could lead to further soil degradation, as found in large areas of land cropped with continuous soybeans under 'zero tillage' in Argentina.

Plate 7. Examples of zero tillage in Argentina.

As clear proof of the stagnation in soil conservation research, the USLE has continued to be used for modelling soil erosion in many places, sometimes complemented with locally-specific empirical models conceptually similar to the USLE. Most soil erosion risk maps have been prepared using the USLE, often in association with GIS and information from past soil surveys. The existing information from previous soil surveys provide limited information about soil system dynamics required for functional interpretations. As a simpler alternative,

frequently dynamic soil properties, mainly hydrological, are derived from already existing static field data using empirical models, pedotransfer functions and inference systems, often with erratic results. The same happens with the evaluation and prediction of salinization in irrigated areas, where often diagrams proposed by the USDA in 1954 are still used. These empirical approaches for the diagnosis of soil and water conservation problems usually lead to gross errors in planning land use and management. They also lead to recommendations and application of generalized conservation practises and structures poorly adapted to the very varied local conditions of topography, soils, climate, land use and cultural habits.

Concurrently, during recent decades there have been considerable changes in land use and management. Agriculture, urban development, industry and mining have continued degrading soil and water resources. Much of the present research in soil and water conservation related to those changes in land use and management is dedicated to isolated aspects and fail to address integrated problems. This is due to limitations of time and funds, to the difficulties of interdisciplinary co-operation, and the compulsion to quickly publish papers. The large volume and diversity of contributions to conferences and publications (books, journals, articles and technical manuals) consist mostly of empirical and theoretical approaches to describing, preventing or reclaiming soil degradation, with very few new

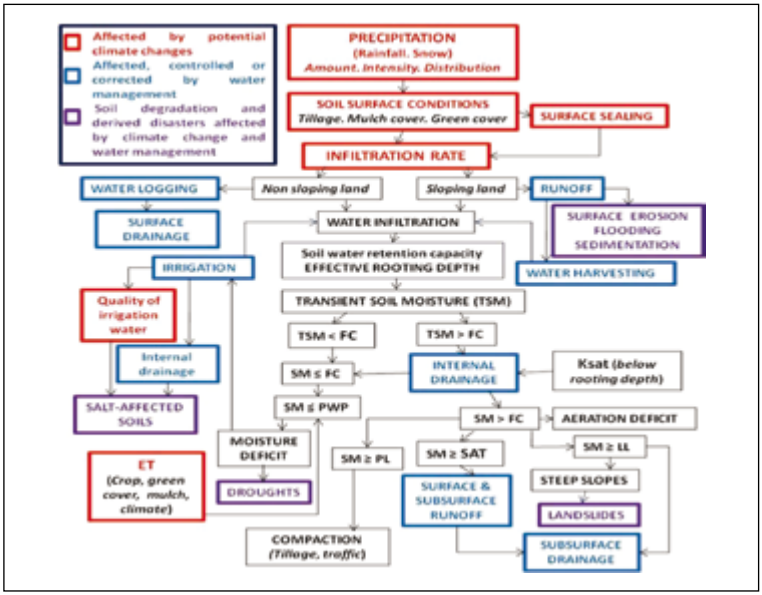

Figure 2. Flow diagram showing relationships between climate change, water management, soil degradation processes and related disasters based on hydrological processes. It has been used to predict soil water balance, soil moisture regime and derived soil degradation processes under different scenarios of climate, soil and soil and water management (Pla, 1997a, 2002, 2006). (SM: Soil moisture at root depth; FC: Field capacity; PWP: Permanent wilting point; SAT: Saturation; LL: Liquid limit; ET: Evapotranspiration).

practical approaches. Based on this vast amount of 'information' we already technically know more than we used to, but soil and water degradation problems continue to escalate. This could partially be attributed to ignoring the quantitative hydrological approach to the evaluation of soil and water degradation processes, and the use of mainly empirical approaches for such evaluations.

There has been more emphasis on the identification, description and mapping of soil degradation and erosion, generally using geomorphological approaches, remote sensing and GIS, than in identifying causes and processes required for the development and appropriate selection of sustainable land management practises. Most studies have focused on problems of surface erosion and only in the last decade have there been attempts to study the important processes of mass movements. However, few cases consider associated hydrological processes.

With a decline in the number of students reading for higher degrees in soil science, many of today's researchers, extension workers and consultants in soil and water conservation have trained in engineering, geography, ecology and environmental sciences. Generally, they are able to identify and map processes and the extent of soil degradation, but unable to identify and apply effective responses. Adequate training in soil science and hydrology is required to provide the knowledge and analytical skills to solve current soil problems.

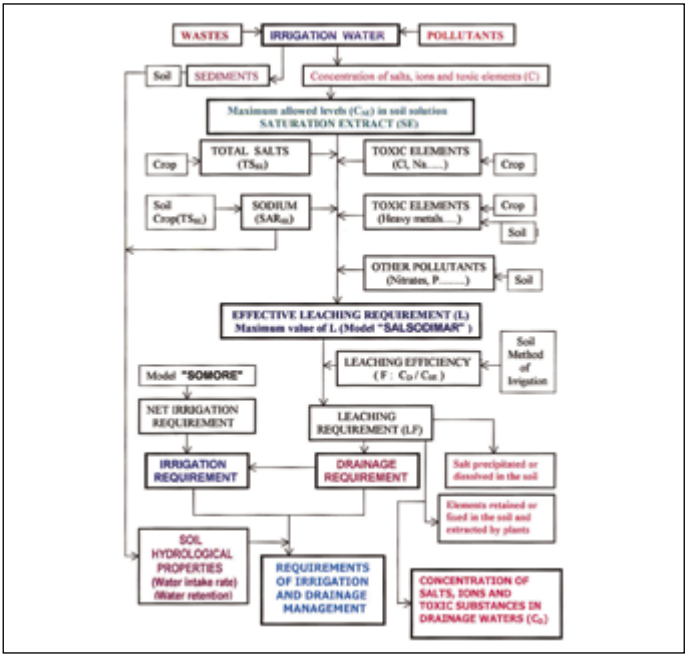

Figure 3. Flow diagram of a conceptual model of a balance of salts and toxic substances in irrigated soils. (SAR: Sodium Adsorption Ratio; Model 'SOMORE': Pla, 1997b, 2002; Model 'SALSODIMAR': Pla, 1989, 1997b).

Conclusions and recommendations for the future

Future research in soil conservation needs to be more integrated with research on water conservation. Research needs to be directed to better understanding of the processes and reactions in soils related to chemical recycling and water balance over a range of spatial and temporal scales, with the common objective of improving crop production and environmental protection. Of particular importance is improved analysis of dynamic processes in soils. This is critical for more efficient use of soil water and energy addressed to increased crop production, overcoming depletion and minimizing risks of soil, water and environmental degradation, as affected by external factors, such as climate, land use and management.

A hydrological approach to the conservation of soil and water is essential for adequate development, selection and application of sustainable and effective land use and management practises. The main objective must be to evaluate such hydrological processes, and to select and develop methodologies and techniques to correct or control them under different conditions of soils, topography and climate. This is required for suppressing or alleviating the negative effects of soil and water degradation on plant growth, sustainable agricultural production, the supply of water in adequate quantity and quality for potential uses and catastrophic events, such as flooding, mass sedimentation and landslides. Moreover, a hydrological approach facilitates strategies for developing sustainable and integrated management of ecosystems, both managed and natural, at the catchment scale. The soil moisture regime is also fundamental for modelling the dynamics of contaminants such as nitrates, heavy metals and pesticides (with and without irrigation), which may lead to drastic changes in the soil water regime and the balance of water and solutes in soil systems.

The currently used empirical models must be replaced with process-based event models, which require better understanding of changing hydrological properties as influenced by soil management, cropping sequences, vegetation and climate. These models must enable detailed quantification of hydrological processes for both actual and potential conditions, answering major questions about soil degradation and crop production in different land management scenarios. While they are being developed, the main benefit of these models is the identification of gaps in knowledge and data, and improved understanding of degradation processes. Process-based prediction models, based on equations that represent fundamental hydrological and degradation processes (including rainfall, infiltration, drainage and runoff) may solve the limitations of the empirical soil loss prediction models (including site specificity and limited transferability).

Although modern indirect techniques like remote sensing, computerized data processing, GIS and simulation models may assist required evaluations, they will always require actual and accurate direct measurements or estimates of soil hydraulic parameters. Better and simpler methods to evaluate and monitor important hydraulic properties of soils and their dynamics on a field scale are especially urgent, for both diagnostic and prediction purposes.

Soil degradation processes invariably have geological, chemical, physical, hydrological and biological dimensions. Lasting solutions will only be found if the complexity of problems is recognized by adequately trained researchers, who then develop appropriate strategies. More soil scientists are required with advanced training in fundamental sciences (physics, chemistry, biology, geology, hydrology) and able to work with agronomists, engineers,

geographers, ecologists and other specialists. Structural improvements in soil science education must adopt a more holistic approach, integrating theory and field work. This would be necessary not only for soil scientists, but for other professionals involved in the design and planning of land use and management strategies. There must be increased co-operation between soil scientists and scientists in related disciplines, and among institutions involved in research and the application of soil and land use and management. This is imperative to guarantee an interdisciplinary and integrated approach in the study and implementation of soil and water conservation. Finally, it is necessary to facilitate and stimulate the publication in soil science journals and related disciplines of papers based on more integrated and interdisciplinary field studies on soil and water conservation.

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The starting point

The territory where the Cajamar Foundation has historically developed the core of its activity is known for suffering from a prolonged deforestation process, bringing about decreased rainfall and severe soil erosion. The consistent economic growth of the previous decade intensified the pressure of human activity on natural ecosystems, thus accelerating the impoverishment of environmental resources. What ancient records describe as productive Mediterranean woodland now sustains a dispersed vegetation layer, colonized mostly by shrub-sized plants with only interspersed fragments of ancient woodland wherever the topsoil remains, whilst the remainder consists of barren land.

Environmental management as a strategic approach

It unreasonable to believe that natural processes alone will restore environmental equilibrium in eroded zones, without any human intervention to fortify the weaker components of the ecological system. However, such interventions run the risks inherent in any attempt to interfere with the natural balance. Our aim has been to argue against the perception that the problem is so immense that ways of reversing the process do not exist. We have progressed this perspective by developing our own tools for environmental management that guarantee the greatest possible success at the onset of projects to modify the state of vegetation in barren or degraded soils. Using this approach favours the potential ecological development of these zones towards a series of stable states of vegetative growth.

The Programme in short

Our driving principle has been the search for a soil amendment capable of compensating for the deficiency of soil organic matter, nutrients and soil moisture found in our soil conditions. It was envisioned that soil degradation could be reversed in large zones of our Mediterranean area if new vegetation communities could be established and encouraged to flourish in eroded and unproductive areas. The desired characteristics of this amendment is the ability to supply nutrients plus the capacity to improve soil structure and retain available soil moisture, thus promoting an excellent ecological balance. Last, but not least, the soil amendment should be available at an affordable price.

The amendment used relies on the composting of vegetable waste from Almería's extensive agricultural greenhouse industry. Over 40,000 ha of greenhouse surface generates about one million tonnes of compost per year, making it a sound candidate as a reliable source of organic matter (Plate 1).

An innovative aspect of the project is the addition of zeolites (a natural aluminium silicate of volcanic origin) to the amendment (Plate 2). This group of minerals is known for its high cation exchange capacity (CEC) and its ability to absorb many types of cations and water

into its structure. This type of amendment, called organo-zeolitic by pioneer researchers such as Dr P. Leggo from Cambridge University (UK), has properties which merit highlighting. The organic matter adds nutrients to degraded soils, whilst the zeolite absorbs water, cations and ammonia that otherwise might be leached out, evaporated or washed away. Altogether, this creates new soil equilibria, improving microbiological life and soil quality.

Practical work commenced in December 2008 following two main directions:

1) The design and testing of an amendment, based on components available in the Almería area, in order to compare experimental results with published work on organo-zeolitic amendments.

2) The analysis of the influence of both the organic components of the amendment and zeolites on soils and plants.

Field studies aim to determine the differences in mortality and growth rates in a selection of indigenous species planted in their natural environment. These studies were carried out on publicly-owned lands throughout the Province of Almería (Plate 3).

To obtain better understanding of the effects of the use of compost and different types of zeolite, an extensive research programme has been in progress since January 2009 in the 'Centro de Investigación Medio Ambiental' (CIMA Environmental Research Centre) of the Cajamar Foundation. The Project is studying the 10 most representative species of local vegetation used in the restoration programme. Plants are grown in pots using an almost inert soil to which have been added varying proportions of amendments composed of different amounts of compost and types of zeolites (Plates 3 and 4).

The pots were maintained at a level of soil moisture similar to that which plants would find in their natural habitat. Variations in the growing medium and the growth rate of plants were measured. Morphometric and phenologic variations in the test group were analysed twice monthly (Plates 5 and 6).

Plate 1. Compost from greenhouse production in the Province of Almería.

Plate 2. Soil-zeolite mix as a growth medium.

Plate 4. Field work in progress.

Plate 3. Field experiments in progress.

Plate 5. Laboratory experiments in progress.

Plate 6. Experiments in progress in the greenhouse.

Preliminary results

Several initial conclusions can be made:

- Generally, soil quality improves with increases in organic matter, cation exchange capacity and nutrient reserves.
- Decreased soil alkalinity has positive effects on plant growth.
- There were significant increases in the rate of species survival in plots where amendments were used, compared with the control plots.
- Seasonal growth of the plants was increased, and this increase in biomass was often statistically significant (Plate 7).

- Results supported the validity of using compost made from horticultural products for increasing soil organic matter content.
- It was shown that the addition of zeolites to organic matter creates a mixture with different properties to the organic matter alone, affecting several parameters, most significantly, decreasing plant mortality rates.
- The influence of four distinct amendments on 10 plant taxons used in ecological recuperation has been evaluated, defining the best mixture and proportion for each.
- The use of amendments considerably prolongs soil moisture availability.
- Significant increases in the amount of natural germination and plant ground-cover was evident in zones treated with amendments.

In summary, we conclude that the use of organic-zeolitic amendments improves the properties of the soil-plant system compared with the corresponding purely organic amendment. These positive changes include improving both root development and the vigour of above-ground growth. The technique provides significant help in establishing ecological recuperation in semi-arid environments with critical soil problems and water deficits.

Plate 7. Investigations of the aerial and root development of ***Ephedra fragilis.***

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European Soil Bureau Network (ESBN) Working Group 4

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Introduction and Rationale

The need to raise awareness and understanding of the importance of soil, both in urban and rural environments, is being highlighted across Europe. This development is required in order to underpin and explain the importance of soil protection to society. The scientific community as a whole is being increasingly asked to connect with wider society, in addition to the traditional focus on our peers. Research outputs are being judged on both their scientific integrity and their relevance and societal impact. In addition to the production of scientific papers and reports, we must find new ways of communicating the importance of soil science to diverse groups, from national and international politicians to primary-age school students. If the pending European Soil Framework Directive is ratified, each of the 27 European member states will be legally obliged to develop soil awareness programmes.

Soil scientists need to deliver the important positive message that soils perform functions, which are essential for life, such as water purification, providing nutrients to grow food and fibre, and providing the habitat for billions of soil organisms, to name but a few. As these functions are often not visible to the human eye, it requires creative thinking to get these messages across. A number of excellent soil awareness and education initiatives already exist throughout Europe from primary school education to informing decision-makers and working with stakeholder groups and ESBN Working Group 4 aims to build on this experience and share experience and best practise using different mechanisms. This short paper illustrates some successful examples of raising awareness in soils, as well as outlining the future plans of the Working Group.

Target audiences

ESBN Working Group 4 has identified three broad groups with whom it is felt the soil society community needs to connect:

The Education sector: covering the ages from primary to tertiary level. By introducing soil science into the school curriculum from an early age it is possible to use 'hands-on' activities to explore and explain basic soil characteristics and functions.

Politicians, policy-advisors and associated agencies: through promoting awareness of soils across several sectors (including Environment, Agriculture, Transport and Energy, Regional Policy, and Development). It is essential that soil protection is recognized and promoted at legislative levels, as currently there is no one single agency or government department responsible for soil policy.

Public stakeholder groups: such as planners, the land based industries (primarily but not exclusively agriculture and forestry), gardeners, NGOs and then, ultimately, all of society.

Approach

ESBN Working Group 4 is multi-national, with representatives from nine countries, and has collectively wide experience of trying and testing different approaches across the three broad groups outlined above.

In the **education sector** we strongly endorse the use of real and low tech. 'hands-on' approaches from an early age (Plate 1). Teaching does not need to be formal, particularly in the early years and 'feel' tests of soil by hand texturing or microscope work can spark the imagination at an early age, even if the detail of the experience is beyond the children. It is also very rewarding for the scientist to see the lovely response of the children! We have experience of both direct involvement in classroom teaching to more indirect methods, such as the development of web-based and other resources for teachers to use in the classroom. While classroom teaching is rewarding for the individual, it is quite demanding on the teacher's time and therefore inappropriate for large-scale awareness raising. However, the direct classroom approach is important at a local scale, where trained and willing staff are available. Increasingly, it is thought that better and more efficient approaches will be needed to provide the teaching community with resources, either through CDs, websites, downloads for white boards, and books (Plate 2 and web link). Many soil scientists are already involved in teaching in the university sector, but other methods such as e-learning and summer schools are also available, both to undergraduates and young (and the not so young!) soil science professionals.

Connecting with the **political process** can be slow but ultimately politicians allocate the funds for much of the research we undertake, so it is essential that we engage at that level. Both parties can learn from each other through mechanisms such as job shadowing and secondments of researchers to policy units. However, more formal documents, such as briefing notes on specific topics, can be very effective. Another mechanism is bilateral workshops and conferences that seek to join up policy and research and these can be useful in establishing mutual trust and the essential human contacts. These cannot be achieved through e-mail and other remote forms of communication (Plate 3).

Public stakeholder groups, including the general public have different demands and interest in soils. We have found attendance at agricultural shows, or similar events, provides a useful mechanism for engaging with specific groups, such as farmers and gardeners. It is essential to work with stakeholder groups to develop materials, which will be put into action and not ignored. A number of best practise guidance notes have been developed at local levels across Europe with the building industry, planners, farmers and gardeners. Use of the media (including television, cinema, radio, the internet and the written word) are means of delivering coverage to a mass audience. Finally, awareness raising to the general public need not be formal, indeed there is a strong argument that it should not be. Several approaches have been tried, including science open-days, museums (Plate 4) and mobile soil laboratories to other more novel methods, such as 'Soil of the Year' (Germany; see weblink), Calendars (Pan European through JRC; see weblink), soil characters (Scotland) and web-based competitions, such as "What do you know about soils?" for younger and older pupils (Slovakia). All of these have attracted positive feedback and experience indicates the importance of finding creative, interesting, simple and fun mechanisms to capture the public's imagination before

they are ready to receive more serious, connected messages about soils. It is essential that we promote to the public the need for safeguarding our soils, as the public have the largest impact upon political decision-making.

Plans

The ESBN Working Group seeks to promote and learn from the many excellent knowledge exchange activities already underway throughout Europe. Indeed, part of the role of the Group focuses on encouraging and promoting these activities. The key role of the group is to provide the facility to collate these many activities and thereby to share best practise and examples to the identified stakeholder groups. The current plans of the group include the following initiatives:

1. Identify and work with existing networks, such as the ESSC, that can assist in raising awareness. We recognize that the Group cannot work in isolation.
2. Identify key topical issues to facilitate engagement with both policy-makers and the general public, such as climate change, food security, habitat loss, water quality and quantity and soil threats.
3. Create a categorized directory of EU and separate national resources, to be hosted on the ESBN web portal.
4. Share knowledge and experience of different mechanisms and best-practises for raising soil awareness.
5. Identify case studies across several policy areas where soils have been crucial. This links closely to item 2 above, in that key topical issues can be 'mapped' against EU DG policy areas.
6. Compile a strategy document, which will outline an analysis of the identified gaps. We will then identify key material required to fill these gaps and provide a commentary on trans-national issues, such as language, culture and differences in educational curricula.

Concluding Remarks

There remains a perception among some scientists that raising awareness of the importance of soils and soil education is either not important or is 'done by someone else.' Many scientists are much more comfortable exchanging information and research results with fellow scientists than with the wider society. It could be argued that, consequently, because of this rather conservative attitude, soils tend not to be placed as high on the environmental agenda as matters concerning air, water, climate and biodiversity. In reality, soils should be at the centre of the environmental debate and soil science must start to redress this balance and rise to the challenge and responsibility. Indeed there is an argument that if the history of environmental regulation were now to be re-written, it should start with the soil resource!

Soil is a highly complex medium and it is often difficult to convey simple messages about soil, particularly to non-specialists. Soil scientists often tend to accentuate the difficulties associated with soil and focus on the more negative aspects, such as threats to soil and soil degradation. Whilst these aspects are indeed very important and deserve continued research funding, there is an associated need to continually accentuate the positive aspects of soil in terms of the wide range of services that soils provide. Indeed this provides the first route for engendering public awareness and support for these issues. **Humankind lives because soils live.**

The members of ESBN Working Group 4 have all taken part in exchanging our knowledge to wider society. We have found this to be very satisfying, although we recognize that there is a fear factor of 'getting it wrong.' If the language and message is passed across in the right way, it has been found that people are genuinely interested in this subject area. However, that should not be the main reason for increased activity. Many report our planet to be at an important point in its history and we also have a moral obligation to inform society and particularly the younger generation of our most important natural resource: our soils.

Plate 1. Young soil scientists of the future?

Plate 2. Soil-net.com classroom soil activities.

Plate 3. An aptly named policy-science Conference.

Plate 4. Getting below ground in the soil museum in Osnabruck, Germany.

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Introduction to the Czech Republic

The Czech Republic is a land-locked country, situated in the middle of the temperate zone of central Europe (Table 1, Figure 1). The Country includes the territory of the historic lands of Bohemia, Moravia and part of Silesia. The State frontiers border Germany (810.3 km), Poland (761.8 km), Austria (466.3 km) and Slovakia (251.8 km).

Table 1. Summary statistics on the Czech Republic

Area:	78,864 km^2
Population:	10,230,060 (according to the March 2001 Census)
Official language:	Czech
Political system:	Parliamentary Republic
Currency unit:	1 Czech Crown (Kc)
Capital:	Prague
Administrative divisions:	14 regions
Religions:	Predominantly Roman-Catholic (39.2%), a large proportion of the population is atheist (39.7%)

Research and Development

The Ministry of Education, Youth and Sports is the central organ of the state administration for pre-school facilities, school facilities, elementary schools, secondary schools and higher education institutions. The Ministry is responsible for scientific policy, research and development, including international co-operation in this area. It is also responsible for scientific titles, for state care of children, youth, physical education, sport, hiking and the representation of the State in sporting activities.

The Central Administrative Office Responsible for Research and Development

(MEYS) is the Ministry responsible for research and development. The Ministry ensures:

a) The preparation of the National Research and Development Policy of the Czech Republic. These are drafted in accordance with international treaties and the monitoring of its implementation in the form of positions on the compliance of the programmes of research and development. The policies are presented as part of the draft National Research and Development Policy of the Czech Republic before these programmes are approved by the Government.

Figure 1. Map of the Czech Republic. (Source, US Central Intelligence Agency (CIA)): http://www.europe-atlas.com/czech-republic-map.htm

b) The preparation of the priorities in the form of the National Research Programme.
c) The implementation of the priorities of research in the areas that are not within the scope of the activities of the providers in the form of ensuring parts of the National Research Programme.
d) The preparation of the legal regulations on research and development and the evaluation of the consequences of other legal regulations on research and development.
e) International co-operation of the Czech Republic in research and development, including meetings with the organs and institutions of the European Union and Communities and the individual member states active in research and development. The exception is international co-operation in defence research and development, for which the Ministry of Defence is responsible.

The central scientific agricultural institution supporting scholarly work, popularization and use of scientific knowledge in practise is The Czech Academy of Agricultural Sciences (CAAS). It is a specialized and professional scientific agricultural institution operating in the Czech Republic. It is a scientific advisory body to the Minister of Agriculture and was founded as a para-governmental organization of the Ministry of Agriculture of the Czech Republic on 1 January 1993. CAAS adheres to the tradition and continues the activities of the former Czechoslovak Academy of Agriculture, which was founded by the edict of the Ministry of

Plate 1. Průhonice Castle, adjacent to the Research Institute at Průhonice. Source: http://data.czechtourism.com/fotografie/2008-07/foto/2008-07-22-074415-pamatky-priroda-pruhonice.jpg

Agriculture on 29 November 1924 and the Ministry of Home Affairs of Czechoslovakia on 5 December 1924 as the central scientific agricultural institution supporting scholarly work, popularization and use of scientific knowledge in practise. CAAS concentrates scientific workers in agricultural research, development and education, as well as scientists and public instructors who contribute to the improvement of agriculture. It represents Czech research and academic communities both inside the Czech Republic and abroad.

Fifty-five Years of the Research Institute for Soil and Water Conservation

'The Research Institute for Soil and Water Conservation' was established by the Ministry of Agriculture on 23 June 2006. Its official start date was 1 January 2007; when it was registered as one of the public research institutions administered by the Ministry of Education, Youth and Sports.

The Institute is the statutory successor to the 'State Research Institute for Soil and Water Conservation, Prague.' This state organization was preceded by the 'Research Institute of Agricultural and Forest Reclamation,' which was established on 1 January 1954. Since 1962, the Institute developed its activities under the denomination 'Research Institute for Reclamation Zbraslav.' In 1977, it re-adopted grassland and pasture management into its research portfolio. In early 1981 it integrated a pedology unit; the 'Pedology Department of the Research Institute for Crop Production and Research Institute for Agricultural Survey of Soils.' Since then until 1990, the Institute bore the name of the 'Research Institute for Improvement of Agricultural Soils.' In 1991 the name of the Institute was changed to the 'Research Institute for Soil and Water Conservation.' In 1993 the research activities of the Institute also incorporated irrigation studies.

The segment of the Institute dealing with reclamation continued the historical activity of the 'Technical Office of the Agricultural Council for the Czech Kingdom,' founded in 1883 and the activity of the 'Association of Agricultural and Forestry Institutes.' The pedology segment has its origin in 1919 within the State Research Agricultural Institutes (Agropedology Institutes), and its soil survey segment is based on the activities of the Delimitation Group founded in 1955 by detachment from the original Research Institute of Agricultural and Forest Reclamation.

The foundation deed defined the tasks of the Institute as advancement of knowledge and transfer of research results in the fields of complex reclamation, pedology, formation and exploitation of the landscape, and informatics related to these fields. The subject matter of its principal investigative activity is basic and applied research and development in the specific areas of:

- Methods of soil survey, mapping, monitoring, and evaluation, land resource use and conservation.
- Forms of exploitation and application of the results of soil survey.
- Minimization of hazardous compound contents in soil and water and establishment of their limits.
- Complex landscape adaptations and rural development.
- Formation and preservation of landscape in areas of special interest, specifically protection zones of water reservoirs.
- Integrated protection and management of water resources.
- Protection of soil against degradation, especially erosion and related processes.
- Anti-flood precautions in catchments.
- Water management in agricultural-forest catchments.
- Regulation of water regimes.
- Revitalization of agricultural-forest watercourses and small water reservoirs.
- Maintenance, renovation, transformation and exploitation of reclamation systems.
- Re-cultivation of damaged land and restoration of contaminated soil.
- Agricultural reclamation.
- Exploitation of grasslands and pastures.
- Evaluation of peat, conservation of peat bogs and other specific biotopes.
- Development of methods for Geographical Information Systems (GIS) related to the fields of reclamation and pedology.
- Participation in international and national research and development centres.
- Scientific, professional and pedagogic collaboration.
- Verification and transfer of research and development results into practise, including advice and the introduction of novel technologies.

An integral, long-term developed part of the tasks is represented by additional activity based on the requirements of corresponding state administration organs or regional self-administration units. This is undertaken in the public interest and supported by public funds according to specific legal regulations. The subject matter of additional activity is associated with the topics of natural sciences, technical and social sciences, focused on complex reclamation, pedology, formation and landscape development, and informatics related to these fields.

The activities of the Soil Service in the area of systematic full-area updates and completion of land evaluation includes many additional tasks. These include additional

survey at specific localities, land assessment, the establishment of mean land prices in individual cadastral regions, collaboration with the Ministry of Agriculture and the Czech Office for Surveying, Mapping and Cadastre (COSMC) in introducing land evaluation to the Land Registry, provision of data in compliance with the decree on the regional analytical documents, regional planning documentation, procedures to register regional planning activities, and management of the SOWAC GIS geo-informational system.

Monitoring of the hazardous compound loading of soil, underground water and surface water in association with the protection of the food chain is performed in compliance with Decree No. 408/1992 of the Government of the Czech Republic. Expert activities are performed based on the resolution of the Ministry of Justice. The scope of these expert authorizations include the economy, nature preservation, water management and agriculture, reclamation and pedology (including the assessment of soil quality and the physico-chemical and reclamation properties of soils). Related activities include land evaluation, protection of soil from contamination, erosion and damage, revitalization of catchments, land re-cultivation, renovation of reclamation systems, protection and management of peat bogs, regulation of water in the soil and landscape, complex land adaptation, protection of water against full-area contamination, advisory activities in the field of reclamation and pedology, preparation and elaboration of technical projects, organization of professional courses, training and other educational events, including lectures.

At its establishment in 1954 the Institute was assigned its principal plan of activities and development, including improvement of water resources and augmentation of crops by the effect of forest growth, research into peat and peat bogs with the purpose of their exploitation in agriculture and forestry, improvement of arable cropping systems by protecting them from water and wind erosion, investigation of augmentation of crops by irrigation and study of the reclamation of low-productivity agricultural and forest soils. Additionally, research of land resource delimitation has been incorporated. Next, the Institute undertook to fulfil tasks aimed at re-cultivation of spoil banks, reclamation of grasslands and pastures, utilization of wind energy in agriculture, and the exploitation of radioisotope methods in hydro-pedological research.

The key area of research in the 1960s focused on the monitoring and adaptation of soil water regimes using data on the suitability of mole and cross drainage, on mechanization implements for subsoil drain maintenance, economic effectiveness of reclamation, technologies for forest soil reclamation, the reclamation of grasslands and pastures, especially in mountainous and foothill regions, and utilization of fertilizing irrigations. Research focused on the specific topics: peat management, agricultural reclamation and improvement of deficient soils, utilization of waste for soil improvement and the establishment of limits for hazardous compounds, re-cultivation of soils damaged by coal mining and definition of re-cultivation procedures for integration of these soils into the landscape. The effect of natural and artificial sorbents on improving sandy soils and loosening of heavy-textured soils, including fly-ash utilization, was investigated. Experimental research also delineated the regions threatened by wind erosion.

In the 1970s interest transferred to the area of soil and water protection, mainly related to the construction of water reservoirs, with research oriented toward full-area agricultural contamination, nitrates in drainage water and sediment transport in surface water. Investigations brought data on the effectiveness of agricultural and forest re-cultivation, measures proposed

to improve deficient soils and diminishing peat resources. The function of grassland turf as a vegetation barrier was evaluated, and mechanisms for maintenance of reclamation waste and flow, including maintenance of watercourse bank growth, were developed.

In the early 1980s, the pedology and soil survey segments were joined with the Institute to form one unit. The mission of the united Institute was to improve the quality of arable soils and methods for their reclamation, transformation and migration processes in the soil, and the function of individual pedo-components. Much research was focused on finding solutions related to erosion and its measurement, problems of small water reservoirs during water quality improvement, technology lines for maintenance of watercourse beds and banks, and investigation of the effects of agricultural management on water quality in the catchments of newly constructed water reservoirs.

The beginning of the 1990s brought a search for novel approaches to scientific problems, as well as the need for adaptation to the new geopolitical conditions for application and selection of research projects, together with changes in their funding regimes. The first half of this period was marked by obtaining and implementing the comprehensive Project 'Minimization of Hazardous Compounds Content in the Systems Soil-Water-Plant-Products' within the programme of the Ministry of Economy called 'Healthy Nutrition.' The Project was aimed at the detection of the hazardous compounds, causes of contamination, the establishment of limits, limitation of transport from the soil and water to the final product, preventive and sanitation measures, alternative ways to improve plant production, and minimization of inputs into the food chain. The Projects were approved in public competitions within the programmes of the Ministry of Agriculture and grants awarded by the Grant Agency of the Czech Republic. Finally, the first institutional research concept was approved and then commenced.

The new Millennium entered with implementation of two institutionally-supported research concepts: 'Comprehensive Solutions to the Problems of Management of Soil, Water and Landscape,' and 'Attenuation of Deleterious Natural and Anthropogenic Effects on Soil and Water,' and 45 co-ordinated and co-investigated projects within the research and development programme. In 2009, implementation of the new research concept 'Integrated Systems for Protection and Exploitation of Soil, Water and Landscape in Agriculture and Development of the Countryside,' as well as seven projects within two programmes of the Ministry of Agriculture, were initiated.

For further information on the Research Institute, please visit:
http://www.vumop.cz

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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, 49 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.

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 539. 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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Announcements

Celebrating the Award of the Degree of Doctor of Science (D.Sc.) to Professor Jean Poesen

It gives me immense pleasure to announce to the ESSC community that Professor Jean Poesen has recently been awarded the fêted and celebrated accolade of 'Doctor of Science' (D.Sc.) from the University of Wolverhampton (UK), for his eminent contributions to Geomorphology and Soil Science. The award took place on 31 March 2010 at The University of Wolverhampton (Plates 1 and 2).

For those of you who may not be familiar with this award title, a D.Sc. is given only to those who have demonstrated that their published work is of an exceptional standard, it contains original contributions to the advancement of knowledge and learning and, in doing so, it has given the candidate international distinction in their particular academic discipline.

Acknowledging a Remarkable Academic Leader

Jean is Professor (*gewoon hoogleraar*) of Physical Geography at the Katholieke Universiteit Leuven (Belgium) where he is Head of the 'Physical and Regional Geography Research Group' (with *circa* 45 staff) and a member of the 'Doctoral School of the Faculty

Plate 1. Professor Jean Poesen in the Platform Party at The University of Wolverhampton (UK) on March 2010.

of Sciences.' This famous seat of learning (founded in 1425) is also where Jean began his own studies. Jean was awarded his M.Sc. degree (1976) in Physical Geography (with 'Great Distinction') and his Ph.D. degree (1983) for his thesis on 'Rainfall erosion mechanisms and soil erodibility' (again, with 'Great Distinction'). Since those early days, Jean has climbed the academic ladder from a Research Assistant to a full Professor and, along the way, he has also held positions as a Civil Servant (at the Department of Soil and Water Policy), Research Director (at the National Fund for Scientific Research) and as Visiting Professor (at the University of Ghent and the Chinese Academy of Agricultural Sciences). Furthermore, he has been an international consultant for numerous global organizations and agencies. These include the United Nations Environment Programme (UNEP), the International Geosphere Biosphere Program (IGBP) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

To date, Jean has been involved in over 80 research projects, which have allowed him to work in many countries. These include Brazil, Burkina Faso, Canada, China, Denmark, Ecuador, Egypt, Ethiopia, Finland, France, Germany, Greece, Haiti, Hungary, Iceland, Indonesia, Iran, Israel, Italy, Japan, Morocco, Nigeria, Niger, Norway, Portugal, Romania, Senegal, Slovakia, South Africa, Spain, Sudan, Switzerland, Syria, Tanzania, Thailand, Tunisia, Turkey, Uganda, UK, USA and Vietnam. Therefore, he is probably already known to many of you. He has successfully supervised over 30 researchers to their own doctoral awards. Moreover, he has authored or co-authored almost 500 scientific publications in a range of national and international leading scientific journals and he has also edited 16 books or special issues of international scientific journals. For this, and in recognition of the outstanding work, he has received a host of honours, prizes and awards. He is affiliated to countless national and international organizations but, most noteworthy to this readership, Jean was one of the founding members of the ESSC.

Plate 2. Professor Jean Poesen receiving the Award of Doctor of Science (D.Sc.) from Professor Caroline Gipps, Vice-Chancellor of The University of Wolverhampton.

Personally, I have had the huge pleasure of knowing Jean for the last decade and I can truly describe him as an illustrious and remarkable research colleague and jovial friend. For me, it has been an immense fulfilment to work alongside him on collaborative research projects, joining him on fieldtrips, and sharing many meals, drinks, stories and jokes. Therefore, it was without hesitation that I leapt at the opportunity to write this article for our Newsletter. From my own experience, Jean's knowledge, enthusiasm, dedication and contributions to Physical Geography and, in particular, Geomorphology and Soil Science, are an inspiration to all who know him. This is a well deserved accolade to a distinguished and professional academic leader and long may it continue!

Well done Jean!

Dr Colin A Booth
School of Technology,
The University of Wolverhampton, UK

E-mail: c.booth@wlv.ac.uk

Book Review

Márta Birkás (2008). Environmentally-Sound Adaptable Tillage. Akadémiai Kiadó, Budapest, 354 pp. (ISBN: 978 963 05 8631 3).

This book deals with the theory and practise of effective soil tillage, with due consideration of both physical and biological inputs. Topics covered range from soil condition and assessment, site factors and tillage operations, soil damage, soil biological activity and lessons learned from tillage practise. In each Chapter, theory is clearly linked to field operations, thus making it illuminating for both undergraduate and postgraduate students and end-users. The complexity of tillage is reflected by the detailed nature of the

text. Examples of the impact of soil management operations on soil structure, quality and performance are largely drawn from published research carried out in Eastern Europe.

Whilst the book is about soil management it may have been useful to draw on more examples of the actual impact of tillage operations on crop yield response. There is, however, much practical information interwoven within each chapter, which makes for stimulating reading. However, for practitioners and/or for quick reference, then an Index would be a very useful addition. The book ends with an interesting section on what has been learned from soil tillage management.

Reviewer
Dr Barry Mulholland
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UK

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Fax. 00 44 1382 562426

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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 ESSC web site is:

http://www.essc.sk

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 Ida Kurincová Kriegerová. In terms of membership lists, contact details and the ESSC web site, please send updated information to Ida at:

E-mail: i.kriegerova@vupop.sk

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).

FIRST ANNOUNCEMENTS

4TH INTERNATIONAL SEMINAR ON SMALL CATCHMENTS DYNAMICS: CONNECTIVITY IN TIME AND SPACE, 22-25 NOVEMBER 2010 IN ISRAEL

The 4th International Seminar on Small Catchments will be held in Israel from Monday 22 November to Thursday 25 November 2010. The Seminar is organized by the Soil Erosion Research Station together with the IAG/AIG smallCATCHMENTS Working Group. The Seminar will explore different aspects of landscape connectivity in small catchments:

- Water, sediment, nutrient and contaminant delivery and storage in natural and disturbed systems.
- Signals of climate change and their impact on hydrological connectivity and sediment delivery.
- Formative flood events and their impacts.
- Hillslope-channel coupling and decoupling.

For further information, please contact:

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Research Hydrologist
The Soil Erosion Research Station
Ministry of Agriculture and Rural Development
Israel.

E-mail: regozi@moag.gov.il

Tel: 00 972 9 8900432
Fax: 00 972 9 8985563
Mobile: 00 972 50 624 1805

The Conference promotes exchange of studies and methods for the investigation of tropical geomorphology in connection with different effects of global environmental change. The Conference programme includes lectures, workshops, two pre-conference and three post-conference field trips and a range of social activities.

Conference Topics

1. Land Degradation and Resilience.
2. Geomorphological Mapping.
3. Quaternary Stratigraphy and Palaeoclimate.
4. Coastal Geomorphology.
5. Geoheritage and Geoarchaeology.
6. Fluvial Geomorphology and Flooding Hazard.
7. Volcanic Geomorphology and Hazards.
8. Geomorphology of Tropical Mountains.
9. Dryland Geomorphology and Desertification.
10. Morphotectonics, Active Tectonics and Seismic Hazards.
11. Landslide Hazard Assessment and Zoning.
12. Environmental Change and Human Impacts.
13. Karst Geomorphology.
14. Geomorphology of Wetlands.
15. Urban Geomorphology.
16. Mining Area Rehabilitation.
17. Planetary Geomorphology.
18. Geoecology.
19. Tectonic Topography.

Field trips:

Pre-Conference Field Trip; Trip 1 (MER): Geomorphology of the Main Ethiopian Rift.

Pre-Conference Field Trip; Trip 2 (AFAR): Tectonic Landforms and Volcanism in the Southern Afar.

Post-Conference Field Trip; Trip 3 (NEH): Geomorphological hazards, land degradation and resilience in the northern Ethiopian Highlands.

Post-Conference Field Trip; Trip 4 (NEHLAL): Visit to Mounts Simien and Lalibela and Lake Tana.

Post-Conference Field Trip; Trip 5 (NEHEX): Visit to the Danakil Depression.

Intensive Course on Landslide Geomorphology and Mapping (LANDMAP).

The First and Second Circulars and Registration and Payment Forms can be downloaded from the IAG/AIG Website:
www.geomorph.org

ORGANIZING COMMITTEE

Asfawossen Asrat, Mohammed Umer, Francesco Dramis, Jan Nyssen.

IAG/AIG REGIONAL CONFERENCE 2011
GEOMORPHOLOGY FOR HUMAN ADAPTATION TO CHANGING TROPICAL ENVIRONMENTS

ADDIS ABABA, ETHIOPIA; 18-22 FEBRUARY 2011

REGISTRATION FORM

Please complete this form and e-mail it to the Local Organizers:
Department of Earth Sciences, Addis Ababa University, P.O. Box 1176, Addis Ababa, Ethiopia
E-mails: asrata@geol.aau.edu.et; asfawossena@gmail.com; moha_umero@yahoo.com

Title	❒ Prof. ❒ Dr ❒ Mr. ❒ Ms.		**Name for Badge**		
Given Name(s)		**Middle Name**		**Family Name**	
Gender	❒ M ❒ F	**Student**	❒ Y ❒ N	**Date of Birth**	_____/_____/_____ (dd/mm/yyyy)
Affiliation					
Postal Address					
State or Province		**Postal Code**		**Country**	
E-mail				**Telephone**	
2nd E-mail (Optional)				**Fax**	
Abstract Title					
Preferred Theme	❒ Land Degradation and Resilience ❒ Geomorphological Mapping ❒ Quaternary Stratigraphy and Palaeoclimate ❒ Coastal Geomorphology ❒ Geoheritages and geoarchaeology ❒ Fluvial Geomorphology and Flooding Hazard ❒ Volcanic Geomorphology and Hazard ❒ Geomorphology of Tropical Mountains ❒ Drylands Geomorphology and Desertification ❒ Morphotectonics, Active Tectonics and Seismic Hazard			❒ Landslide Hazard Assessment and Zoning ❒ Environmental Change and Human Impact ❒ Karst Geomorphology ❒ Wetlands Geomorphology ❒ Urban Geomorphology ❒ Mining Areas Rehabilitation ❒ Planetary Geomorphology ❒ Geoecology ❒ Tectonic Topography	
Preferred Presentation	❒ Oral ❒ Poster	**In which Pre- and/or post-Conference Field trip will you participate?**		❒ MER; ❒ AFAR ❒ NEH; ❒ NEH-LAL ❒ NEH-EX; ❒ LANDMAP	
Need Invitation Letter for Visa	❒ Y ❒ N	**Apply for Sponsorship?**	❒ Y ❒ N		
Arrival Date	_____/_____/2011 (dd/mm/yyyy)		**Departure Date**	_____/_____/2011 (dd/mm/yyyy)	

Conference on Land Quality and Land Use Information in the European Union, Keszthely (Hungary), 26-27 May 2011

Following recent scientific and policy developments, which are also reflected in international environmental agreements, land quality is now regarded as an integral measure of different aspects of land ecosystem services.

The Hungarian Academy of Sciences, together with the European Commission (Eurostat, DG Environment and the Joint Research Centre) and the University of Pannonia is organizing a Conference on the issue. This is in association with the Hungarian Presidency of the EU.

The Conference plans to facilitate the exchange of information and views among stakeholders involved in different aspects of land quality management; including research, policy planning, soil management and conservation.

Among the goals of the Conference is to enhance the understanding of the role of land quality in rural systems and to progress the development of land information, land use planning and related services based on land quality on different levels; from farm to continental scales.

The list of the addressed topics, and much more information, is available on the Conference website:

http://landq2011.uni-pannon.hu/

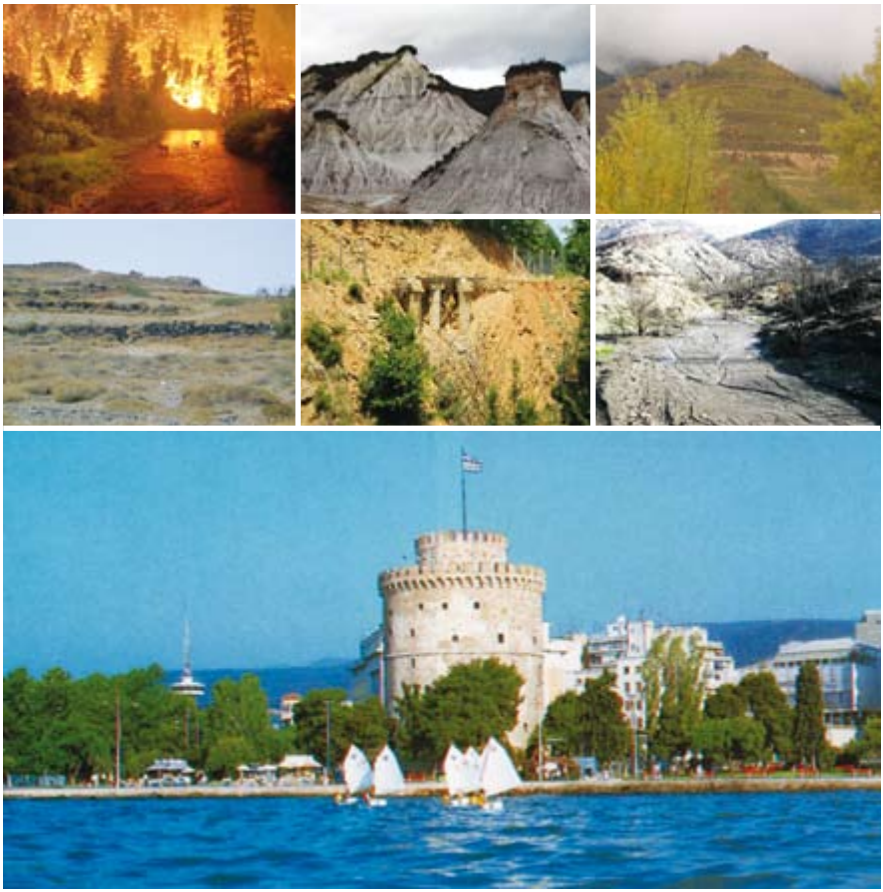
Registration to the Conference is now open.
To register and submit papers for presentation please visit the Conference website.
The deadline for paper submission is 30 November 2010.


Land Quality and
Land Use Information
in the European Union
International conference
26-27 May, 2011
Keszthely, Hungary
Organisers
Hungarian Academy of Sciences
University of Pannonia
European Commission
(Joint Research Centre, DG Environment, Eurostat)
In association with
the Hungarian EU Presidency
Ministry of Agriculture and Rural Development
Republic of Hungary

EUROPEAN SOCIETY for SOIL CONSERVATION

6TH INTERNATIONAL CONGRESS OF THE EUROPEAN SOCIETY FOR SOIL CONSERVATION

"Innovative Strategies and Policies for Soil Conservation"



9-14 May 2011

NAGREF

EUROPEAN SOCIETY for SOIL CONSERVATION

Dear Colleagues

On behalf of the Organising Committee, I have the pleasure to invite you to the **6th International Congress of the European Society for Soil Conservation entitled *"Innovative Strategies and Policies for Soil Conservation".*** This event will be held in Thessaloniki, GREECE, from 9-14 May 2011. It is a golden opportunity to participate at a major scientific event where the latest research findings and scientific and technological developments will be presented in numerous thematic fields. Special focus is given in the multi-disciplinary coverage of the selected themes to be covered by the Congress and you are invited to honour the scientific sessions with your contribution. Scientists from all over the world will be participating in a scientific forum to deliver the state-of-the-art in the selected scientific themes, meet with old colleagues, make new friends and start new co-operations.

Thessaloniki is at the crossroads between East and West; a marvellous seaside city with quaint historic districts, museums, cultural heritage, night life, transportation infrastructure and good connection with other European countries and Athens. The blend of high quality scientific sessions with what the host city and its surroundings have to offer will ensure that your participation will be a memorable one. We do hope you will take this opportunity to contribute to the overall success of this Congress and invite you to fill in the attached pre-registration form. Details of the Congress will be soon available through the official web site of the Congress and the circulars that will be posted to all pre-registered participants.

Please visit: www.esscthessalonikicongress.gr.

We look forward to seeing you in Thessaloniki

Dr Theodore Karyotis

President of the Organizing Committee

PRE- REGISTRATION FORM

"Innovative Strategies and Policies for Soil Conservation"
9-14 May 2011
GRAND HOTEL PALACE***, Thessaloniki, GREECE**

First Name	
Surname	
Organization	
E-mail address	
Telephone Number	
Contact Address	
I intend to present a paper(s) under thematic unit(s)	
I will probably participate without a presentation	

Please complete the congress pre-registration form and send it by e-mail to karyotis@nagref.gr or karyotis@hellasnet.gr

Please visit the new official Congress website: **www.esscthessalonikicongress.gr.**

THEMATIC Sessions

1. Policies and thematic strategies for soil protection.
2. Soil mapping and land evaluation for land use planning.
3. Forest fires impacts on natural resources.
4. Sustainable management of wetlands.
5. Policies and strategies for combating desertification.
6. Socio-economic aspects of land degradation.
7. Soil and water management under global climatic change scenarios.
8. New generation biofuels and their environmental effects.
9. Conservation and management of soil biodiversity.
10. Restoration and remediation of degraded lands.
11. Special session on 'Education in soil conservation and public awareness.'

Welcome to Thessaloniki

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.
(iv) A reference list of your 'new' international refereed scientific journal papers, which have been published recently (since and including the year 2000).
(v) 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: c.booth@wlv.ac.uk
and they will include this information in the next issue.

PLEASE NOTE:
We publish four Newsletter issues per year. The deadlines are:
10 January; 1 April, 1 July and 1 October.

Some Closing Thoughts:

"Nature had invested all her gold
In the industry of the soil."

(Ronald Stuart Williams, 1913-2000)

"Out of the soil the buds come,
The silent detonations
Of power wielded without sin."

(R.S. Williams)

"One may not reach the dawn save by the path of the night" *(Kahlil Gibran, 1926)*

"Your pain is the breaking of the shell that encloses your understanding" *(Kahlil Gibran, 1926)*

"Each object you overcome is a stepping-stone on your path to greatness. Appreciate the obstacle, for it empowers you to courageously face future barriers in your quest for success"

(Tavis Smiley)

"The best students get the hardest tests because they can handle them" *(Iyanla Vanzant, 2000)*

"Nobody trips over mountains. It is the little stones that cause us to stumble"

(David Baird, 2000)

"True hope is swift and flies with
swallow's wings;
Kings it makes gods, and meaner
creatures Kings."
(William Shakespeare, Richard the Third, Act 5, Scene ii)

"Failure is merely an opportunity to more intelligently begin again" *(Henry Ford)*

"He who smiles rather than rages is always the stronger" *(Japanese proverb)*

"The significant problems we face cannot be solved at the same level of thinking which created them" *(Albert Einstein, 1879-1955)*

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.essc.sk

MEMBERSHIP FEES

I wish to (please mark appropriate box):

- Join the ESSC
- Renew my membership of the ESSC
- Know whether I have outstanding membership contributions to pay

Membership rates:

Standard Rates:

- One year € 25.00
- Three years € 70.00

Members in Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia and Ukraine:

- One year € 10.00
- Three years € 25.00

Students:

50 % reduction on above rates for three years
Your supervisor must provide written confirmation of student status

I wish to pay my membership contribution by (please mark appropriate box):

- Eurocard / Mastercard
- Visa Card
- American Express Card
- Bank Transfer

Branch address: Fortis Bank, Zonnestraat 2, B-9000 Gent, Belgium;
International transaction codes:
IBAN - BE29 0014 5139 8064 and BIC - GEBABEBB;
Account name: European Society for Soil Conservation;
Account number 001-4513980-64

CARD NO. ..... EXPIRY .....

Amount: € ..... Date: ..... Signature: .....

NAME: .....

ADDRESS: .....

.....

E-MAIL: .....

MEMBERSHIP NUMBER (if known): M0 .....

Please send this form to: ESSC Treasurer, Dr Wim Cornelis, Department of Soil Management and Soil Care, Coupure links 653, B-9000 Gent, BELGIUM.

wim.cornelis@UGent.be