NEWSLETTER

3/2007

ESSC EUROPEAN SOCIETY for SOIL CONSERVATION

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Cover photo: Strip cropping along the contour and a grassed waterway
(centre of photo), on Mollisols in Illinois, USA
(photo by Tim McCabe (USDA-NRCS) and supplied by Dr Richard Arnold).

E.S.S.C. NEWSLETTER 3/2007

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From 25-30 June 2007, the Fifth International Congress of the European Society for Soil Conservation (ESSC) took place in the City of Palermo (Sicily, Italy), under the theme 'Changing Soils in a Changing World: the Soils of Tomorrow'.

Soil must be considered as a cornerstone of present and future human development and of the sustainability of global ecosystems. In recent decades, the need for increased food production to sustain an ever-growing population, the over-exploitation of natural resources to increase economic benefits and exponential urban and industrial development have produced clear responses from nature. These responses have been expressed in floods, landslides, contamination, exhaustion of soil fertility, climate change and the advance of desertification. Thus, soil preservation, restoration and adequate management are imperative and the 5th ESSC International Congress must be viewed within this context.

Under these main premises, the Congress attracted over 400 participants from 52 countries, representing national and international societies of soil science, research agencies, universities, government bodies, higher education institutes, scientific organizations, public non-governmental organizations and business. A very important aspect to highlight was the greater participation of young researchers and students in the Congress. This reflects the increasing societal concern over environmental conservation and protection, in particular soil related aspects. Increased involvement of young scientists is encouraging for the future of soil conservation issues.

The Congress started on Monday 25 June, with an excellent opening ceremony in the Main Hall of the University of Palermo, hosted by the Chairman of the Organizing Committee, Carmelo Dazzi, accompanied by the welcome speech of the Under-Secretary of the Italian Ministry of the Environment, Mr. Bruno Dettori. Some words from representatives of the Regional Government, City Council and University preceded the beginning of the scientific part of the Congress. The scientific component was opened with commentary from the President of the ESSC, José L. Rubio, who focused on the concept of soil conservation, its evolution and the increasingly important role of the multifunctionality of soils. To complete the ceremony, Professor Ahmet Mermut (Chair of Division 1 of the International Union of Soil Sciences) presented his 'Lectio Magistralis,' discussing the importance of soils in the context of human development through history and stressing the interconnectivity between soil system dynamics and other earth surface systems.

Grants were provided by the ESSC to support the attendance of five young researchers (less that 35 years old, who work in European countries) at the Congress. This was the launch of the new initiative and should be maintained for future Congresses of the ESSC.

The scientific sessions between 27-29 July were divided into eight parallel sessions: (i) Soils and Society, (ii) Soil Erosion, (iii) Soil Organic Matter, (iv) Soil Degradation and Desertification, (v) Soil Pollution and Contamination, (vi) Soil Conservation and Soil Quality, (vii) Policies for Environmental Conservation in a Global Society, and (viii) New Approaches and Technologies for Soil Assessment, which embraced 58 related topics. During this time a total of 112 oral presentations, over 330 posters and eight invited lectures were presented. From all these scientific contributions the most recurrent themes were soil restoration and remediation, water and wind erosion, soil pollution assessment, decline in soil fertility and soil characterization and mapping. The new methodologies and approaches to soil evaluation had an important role in the Congress, from the applicability of neural networks for desertification assessment, modelling and soil evaluation, to the use of sophisticated techniques, such as VIS-NIR-SWIR reflectance spectroscopy, land information systems, new GIS-based techniques and new biotechniques. These discussions reflect the continuous efforts to advance and improve the fields of soil assessment and conservation.

The importance of human induced degradation and processes on soil was also reflected in numerous presentations. This included the contribution of N.E. Smeck (Ohio State University) on the new modification of the USDA Soil Taxonomy, to facilitate the inclusion of aspects related to human activities in soil properties and classification. In relation to this, it is necessary to mention the interest observed in the presentation and applicability of the new World Reference Base for Soil Resources (2006).

A 'best poster trophy', one for each of the eight congress sessions, was awarded by the Congress organizing committee. The best posters were selected by the secret ballot of Congress participants, which was counted at the end of each day's sessions.

On Wednesday 27 July, the ESSC General Assembly was held, in which the new Council of the Society, together with the representatives of the member countries, were elected and approved. During the General Assembly, Professor Theodore Karyotis presented the case for the City of Athens being the location of the next ESSC Congress in 2011, which was approved unanimously. The General Assembly discussed and approved a statement in support of the EU Soil Framework Directive, to be sent to the EU Commission. This is the first document from the Commission which tries to deal comprehensively with soil protection issues. Hopefully, with the approval and application of the Directive, there should be the political commitment to consider soil and its protection and preservation to the same extent as other environmental media, such as water or air, and to promote soil sustainability.

After a long journey, riddled with difficulties, the necessity of joining efforts to reach the final approval and application by the European Commission of the 'EU Soil Framework Directive' is unquestionable. In this sense, the ESSC has played a relevant role as an international scientific society and, through its members, has actively participated in the preparation of this Directive. Members should give their support and commitment to bring the Directive to full fruition and implementation.

The next day, Thursday 28 June, the new Council elected the Executive Committee for the next mandatory period (2007-11).

At the end of the Congress two post-congress excursions took place. These were to Sparacia Farm and Temple Valley in Agrigento and the Belice area and Selinunte Archaeological Park. During these visits we observed interesting examples of soil conservation research and zones with problems of soil consumption and inadequate land management, together with very attractive archaeological sites. One extra-congress excursion visited the world-famous area of Etna volcano during 1-2 July.

The core idea reflected in the Congress was the need to assume soil protection as the basis for the sustainability of ecosystems and human society, through knowledge of soil functions and capabilities for food production, maintenance of human structures and sustaining the survival of world ecosystems. Soil conservation has become an indispensable strategy in socio-economic development.

During the closing ceremony of the Congress, the following resolutions were unanimously approved by all the participants.

Resolutions of the 5th International Congress of the European Society for Soil Conservation (ESSC) held in Palermo, 25-30 June 2007

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The 5th International Congress of the European Society for Soil Conservation (ESSC) on 'Changing Soils in a Changing World: the Soils of Tomorrow', involving over 400 participants from 52 Countries, representing national and international societies of soil science, research agencies, universities, government bodies, higher education, scientific institutions, public non-governmental organizations and business, **hearing** the results of the invited lectures of the 112 oral presentations and over 330 posters presented from the thematic sessions, **identified** that the level of degradation of natural resources, and particularly soils, as related to the pressure of human activities, is becoming progressively more evident in many areas of the world; that the level of soil pollution, degradation and desertification is continuously increasing particularly in the countries with high levels of development; that the processes of soil degradation and desertification are affecting also the countries of low economic development and harsh climatic conditions; that the per-capita amount of good healthy soil is continuously decreasing all over the world; that the most common words used by all the participants are: soil erosion (including wind and water erosion), soil compaction, desertification, salinization, heavy metal contamination and soil pollution, reduction of soil fertility and organic matter content, soil sealing and soil consumption; **considering** the importance of the multi-functionality of soils and the impact of these on human health and welfare all over the world; the Communication from the European Commission 'Towards a Thematic Strategy for Soil Protection'; the European Council's conclusion on integrated soil protection; **request** that decision makers, land managers and administrators:

ensure application of sound environmental management technologies for soil care, soil conservation and soil improvement, so as to ensure the environmental health for present and future generations;

recognize the importance of high quality soils for agriculture and the environment and to protect this valuable resource from degradation and consumption;

apply soil information and scientific knowledge more effectively in order to protect and safeguard the ecological and life support capacity of soils;

develop a robust and sound Soil Framework Directive;

stress the importance of these natural resources in maintaining and safeguarding environmental equilibria for human health and well-being and recommend that all Governments and relevant institutions:

develop environmental policies aimed to favour the behaviour of the soils as a sink of organic carbon to ameliorate the Greenhouse effect;

pay particular attention to maintain and re-establish the special function of soils to produce goods and services of high quality and quantity; and to

pay particular attention to maintain and to re-establish pedodiversity, which influences all living systems and the quality of life.

Plate 1: José L. Rubio (President of the ESSC) during his welcome address on 25 June 2007.

Plate 2: Carmelo Dazzi, Chairman of the Congress Organizing Committee, presenting Professor Ahmet Mermut with the 'Crest of the University of Palermo' after his 'Lectio Magistralis' on 25 June 2007.

Plate 3: The participants to the scientific excursion to Sparacia Farm and Temple Valley of Agrigento (30 June 2007).

Minutes of the ESSC Council Meeting held in Palermo on 25 June 2007

Present: J. L. Rubio, M. A. Fullen, L. Øygarden, P. Bielek, A. Kertész, T. Karyotis, A. Canarache, D. Gabriels, I. Pla Sentis, C. Dazzi, E. Costantini, L. Stroosnijder, A. Rodriguez Rodriguez.

Apologies: K. Helming, T. Scholten, B. Jankauskas, R. Kolli, P. Strauss.

Agenda:
1. Welcome and Introductory Remarks (J.L. Rubio, C. Dazzi).
2. Report by the Treasurers (D. Gabriels).
3. Report from the Editor-in-Chief (M.A. Fullen).
4. Report by the Secretary (P. Bielek).
5. Council elections for the period 2007-2011 and General Assembly.
6. ESSC Awards.
7. Report from the President.
8. Reflection on the future of the ESSC.
9. Next ESSC Congress.
10. Review of recent and future activities.
11. Other issues.

Point 1 J. L. Rubio (President of the ESSC) opened the Council meeting by greeting the participants. He extended his appreciation to the Congress Organisers for their great efforts in preparing the Congress.
On behalf of the Congress Organizers, C. Dazzi (Vice-President of the ESSC) expressed his welcome to all Council members.

Point 2 D. Gabriels submitted the written Treasurer`s Report and summarized the main points. These included evolution of the ESSC membership and the situation regarding the payment of membership fees, which could be improved. He presented the financial situation and current income and expenditure of the ESSC.
The Council approved that the Treasurers send a letter requesting all members who have not paid their membership fees to fulfil their duty as soon as possible. In the same way, National Representatives will be provided with a list showing the state of the membership contributions in their respective country. Beyond this, from 1 January 2008, at every meeting, conference and congress sponsored by the ESSC, organizers must include, besides the regular registration fee, an extra fee for non-ESSC members. This additional fee will cover their membership fee for one-year. This extra fee will be not be included in the conference fee, but directly transferred to the ESSC account. A membership desk will also be established at future ESSC events.

Point 3 M. A. Fullen (Editor-in-Chief) informed the Council of the main publishing activities of the ESSC. Since the last Congress (Budapest, May 2004), the ESSC has published nine Newsletters and the Directory. The next issue of the Newsletter is scheduled for August 2007. The recent incorporation of 'Guest Editorials' is proving popular with members. However, there was still a need for additional contributions.
The ESSC web site is being improved, developed and is increasingly used. The new 'Bulletin Board' facility has been welcomed by the membership and is being increasingly used for rapid dissemination of information. The citation details of papers produced by ESSC members since 2000 are also listed on the web site and are increasingly used for research and teaching purposes. The citation details of Ph.D. theses completed by ESSC members since 2000 are also reported on the ESSC web site. There was some discussion on producing a future CD of the citation database, when the number of contributions has notably increased.
The Editor-in-Chief recognized and thanked colleagues who were actively supporting the publishing activities. Special recognition was made of Dr Colin Booth (Wolverhampton) and Professor Pavol Bielek and Ms. Zuzana Tekelova (both from Bratislava).

Point 4 P. Bielek presented the report of the Secretary. During discussion, a common consensus was reached that members who do not remit their membership fees will not receive the ESSC Newsletter in future. The list of unpaid members will be collated.

Point 5 The following ESSC members were appointed to the ESSC Council:
Austria: P. Strauss.
Belgium: D. Gabriels, J. A. Poesen, W. Cornelis.
Bulgaria: vacant.
Croatia: will nominate later.
Czech Republic: J. Podhrázská.
Denmark: P. Schjønning.

France: vacant.
Germany: T. Scholten, K. Helming.
Greece: T. Karyotis, N.J. Yassoglou.
Hungary: A. Kertész.
Italy: C. Dazzi, A. Constantini, D. Torri.
Lithuania: S. Marcinkonis.
Romania: M. Dumitru, G. Jiareanu.
Moldovia: vacant.
The Netherlands: L. Stroosnijder.
Norway: L. Øygarden.
Poland: vacant.
Portugal: vacant.
Russia: I. Vasenev.
Serbia: vacant.
Slovakia: P. Bielek.
Spain: I. Pla Sentis, J. L. Rubio.
Sweden: vacant.
Switzerland: vacant.
United Kingdom: M.A. Fullen, R. P. C. Morgan.
Ukraine: S. J. Bulygin.

Point 6 In a secret poll, Professor Nicolas J. Yassoglou won the 'G. Richter Award' for 2007.

Point 7 The ESSC President informed the Council regarding:

- Progress in preparation and ratification of the 'EU Framework Directive on Soil Protection'.
- Activities of the international network 'DesertNet.'
- Activities in relation to other international organizations and societies.
- ESSC activities in relation to the ISCO Conference, to be held in Budapest in May 2008.

Point 8 ESSC Council Member, T. Karryotis, informed the participants on preparatory activities for the next ESSC Congress, to be held in Athens in May 2011.

Point 9 Discussion was held on the composition of the next Executive Committee. The Discussion of the first meeting of the new ESSC Council, held on 28 June 2007, will be reported in Newsletter 2007/4.

Palermo, June 25 2007

Pavol Bielek, Secretary

ESSC statement in support of the EU Soil Framework Directive (Palermo, 27 June 2007)

ESSC statement in support of the EU Soil Framework Directive (Palermo, 27 June 2007)

At the 5th Congress of the European Society for Soil Conservation (ESSC) held in Palermo from 25-30 July 2007, the following statement was presented, discussed and adopted by the General Assembly of the ESSC. The Statement has been forwarded to the European Commission, the European Parliament and EU Member State representatives.

The initiatives developed in 2002 by the European Commission to address the problems of soil degradation and the ways to prevent further degradation represents a historical achievement and is summarized in the EU Communication entitled 'Towards a Thematic Strategy for Soil Protection (COM 20002-179).

This Communication raised the expectation of EU citizens, academic bodies and research organizations on institutional measures and actions aimed to achieve the adequate appraisal of soil as a crucial and essentially non-renewable natural resource and as a natural system, which provides many economic benefits and important ecological functions.

However, further developments of the Commission substantially lowered the scope and goals of the previous Communication of 2002, mainly through: a) the Communication on the

Thematic Strategy for Soil Protection (COM 2006-231), b) a Directive (COM 2006-232) establishing a framework for the protection of soil and amending Directive 2004/35/EC and c) an impact assessment (SEC 2006-620) of the 'Thematic Strategy for Soil Protection'.

The ESSC, as a pan-European research network founded and acting since 1988, with representatives from all European countries and including most important individuals and institutions actively involved in soil conservation, is concerned with the diminution of the political level of ambition at some institutional stages and with the restriction and limitations expressed by some organizations.

These developments represent a menace to the adequate and essential common European framework for protecting our soil resources. The increasing ecological, social, economic and cultural demands placed on soil at the European level should be addressed by a robust and ample set of actions and measures to guarantee a sound Soil Framework Directive that will prevent further soil degradation and stimulate the development of new strategies for the sustainable management of European soil resources.

The ESSC, through this document approved by its General Assembly held during the 5th ESSC Congress (Palermo, 27 June 2007), wish to transmit to the EU Commission its collaboration and support for the vision and commitment to protect European soil as a common asset and valuable economic and ecological resource.

Letter from the President: after the Palermo Congress, some points ahead

The 5th ESSC Congress held in Palermo (25-30 June 2007) was a success. It was widely attended (with over 400 participants), we had good scientific presentations and discussions, the organization was excellent, thanks to the efforts of Carmelo Dazzi and his dedicated and very kind team, and we enjoyed the charm that Palermo-Sicily offers from its historical dimension and environmental beauty. We also verified how climatic conditions could be of concern, because during the first two days of the Congress it was extremely hot, owing to the Sirocco wind from North Africa.

We have now a new Council and Executive Committees (you can see the composition in this Newsletter) that will serve until the next (6th) ESSC Congress, that will most probably be held in Athens in May 2011. I feel honoured and privileged serving as ESSC President for the new term. Thank you very much for the confidence you place in me. I will dedicate my efforts and energy to this worthwhile and challenging undertaking, but I also count on your support as a member of our common scientific venture.

During the Council meetings and General Assembly in Palermo, we discussed the priorities for the next period. One of the main aspects is the continuity of ESSC involvement in the development of the 'EU Strategy on Soil Protection' and the 'EU Soil Framework Directive (SFD)'. These initiatives are of paramount importance for us, because they will probably establish the reference for soil consideration in the EU for the next 15-20 years. The level of appraisal, ambition and commitment of the SFD will have crucial consequences on the perception of soil, on resources allocation, on budgets for soil research programmes, on scientific debate, and of course, for better use and management of European soil resources. One of the main outputs of the 5th Congress is the ESSC Statement is an expression of support for the EU SFD, reported in this Newsletter. The Statement has already been presented to the EU Commission, the EU Member State representatives, the European Parliament and has been distributed to various international organizations and associations with an interest in soil issues.

Other important aspects for consideration in the near future derive from the new open scenarios for soil conservation displayed as a consequence of new scientific, environmental and social perceptions and needs. Increasingly, it is recognized the crucial role that soil plays in food production, in ecological functions, in regulating the hydrological cycle, as a climate regulating system and its implications for global issues, such as environmental security, poverty and migration. In all these aspects, new soil conservation approaches should be developed to offer answers to scientific and social demands. The science of soil conservation, and so the ESSC, has important challenges ahead to actively contribute with better scientific understanding of soil functioning and with innovative appraisals for the protection and sustainable use of soil.

ESSC is steadily improving and progressively becoming more recognized and valued. It could be said that the Society is on a good track. However, we have numerous aspects to improve, especially membership. A powerful circumstance to fulfil the aims and goals of the ESSC is to increase the dimension and activities of our network. But activities, besides the generous and free efforts given by members, require economic resources. Increasing membership implies also an improved economic and financial situation. Financially, the ESSC relies only on the membership fees. If we substantially increase ESSC membership, we will have multiple benefits, including better economic capacity to undertake initiatives such as publications of ESSC books, providing special grants for young researchers, editing

materials related to soil conservation and, in general, more visibility and influence at scientific and societal levels. In this context, I propose to all of you a simple mechanism to increase membership. The idea is that every ESSC member should commit themselves to recruit a new member. In this way and in less than a year, we could double our membership and cross the psychological barrier of 1000 associates. This idea was presented during the Closing Session of the Congress. So, lets go to recruit, each of us, at least a new colleague for the ESSC!

Another important item is to continue improving the ESSC Newsletter and ESSC web site. Both aspects, particularly the Newsletter, are of a substantially improved quality, thanks to the efforts and dedication of Mike Fullen and Pavol Bielek and their teams. The Newsletter is the communication tool between members and it is the instrument to disseminate useful information and views. We should increase the potential of both communication instruments by increasing participation of members through sending contribution on scientific aspects, opinions, suggestions, ideas, proposals for research projects and a long list of other useful information. Council Members should particularly stimulate and actively contribute with participation at national level. The Newsletter and web site is open to you.

Finally, and contemplating the next ESSC period, I would like to share with you the feeling that our Society made good progress during the last 19 years and it is now a consolidated scientific network, with increasing recognition and influence. The near future is a challenging period for soil issues. However, I am sure this will also be a period of great scientific opportunities for soil conservation. If we have the commitment and inspiration to contribute with innovative and appropriate approaches, we could make a scientific impact, we will offer responses to European demands and we will make our Society more useful and valuable.

José Luis Rubio
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Conferment of the 'Gerold Richter Award (2007)' on Emeritus Professor Nicholas Yassoglou

The ESSC Council, at its meeting held in Palermo (27 June 2007) during the 5th ESSC Congress, conferred on Professor Nicholas Yassoglou the 'Gerold Richter Award 2007' for his long and successful career of scientific contributions to soil conservation and to increased social awareness of soil degradation problems.

Nicholas Yassoglou is an Emeritus Professor in the Agricultural University of Athens. His first graduate degree was in Forestry, received from the University of Thessaloniki. His Ph.D. was in Soil Science, awarded by Michigan State University (USA), followed by post-doctoral research in nuclear chemistry at the University of Illinois.

The main professional positions of Professor Yassoglou were the following: (a) Head of the Agronomic Applications Department in the Greek Nuclear Center of Democritus, (b) Professor of Soils and Agricultural Chemistry in the Agricultural University of Athens, (c) Visiting Professor in Purdue University (USA), (d) Vice-Director General of Higher Education in the Greek Ministry of Education, responsible for the development of new universities, and (e) Chairman of the Greek National Committee for Combating Desertification.

Professor Yassoglou has established and organized four Soil Science laboratories in Greece. He has also participated as co-ordinator or chairman of many scientific committees

and groups, including such topics as soil resource management, soil conservation, combating desertification, research development and the organization of national and international conferences.

Professor Yassoglou has great experience on: forestry, soils, applications of atomic energy in agriculture, remote sensing, desertification and the environment and educational planning. He has made a great contribution to research, which is proven by many publications in journals, invited papers, key-note addresses and chapters in books. Many of the research projects were supported by competitive international funding. He is the author of three books on soil science in Greek.

Professor Yassoglou has greatly contributed to the establishment of modern soil science in Greece in the last four decades. He initiated the Soil Survey in Greece by developing a new parametric system of mapping, which has been applied in many areas of the country. He has compiled the Greek soil map at the scale of 1:1,000,000 and incorporated the map into the European soil map, including information related to the sensitivity of the land to degradation and desertification. He has served for many years as a member of: (a) the soil erosion group in the European Soil Bureau of the Joint Research Centre and (b) the desertification experts group of the European Council.

In recognition of such a distinguished record, the Council of the ESSC are delighted to confer the 'Gerold Richter Award 2007' on Professor Nicholas Yassoglou and to congratulate him on his eminent contribution to soil conservation.

José Luis Rubio

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Introduction of Guest Editorials

This issue of the ESSC Newsletter presents the second 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. The second in our series is from Dick Arnold (Washington DC). Scheduled Guest Editorials include Roy Morgan (Silsoe, UK), Mark Nearing (Tucson, Arizona) and Samran Sombatpanit (Bangkok). Eventually, we envisage this collection of essays developing into an authoritative book.

GOING OUR WAY?

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Oh no – not more?

It is somewhat daunting and frightening to read a newspaper or listen to TV news reports, because the messages are usually about tragedies and disasters. AIDS is outrunning current rates of treatment, malaria still looms large, there are random shootings, terrorist bombings, civil strife and conflicts, tsunamis and tornadoes, forest fires and droughts, and there are frightening statistics on unemployment, poverty, and malnutrition. On and on goes the droning repetition about activities, events, and victims, overwhelming our senses and lulling us into a numbness that all too quickly develops into apathy – that stupefying retreat into our inner recesses where we find temporary respite from the massive overload of information.

Wait a moment. Most of us are truly compassionate about the tragic loss of life and about sharing the ability to have an appropriate and meaningful life. As such this information reaches our inner sensibilities – we do care about individuals so affected. As environmentalists we care about all living things and their environments – especially

when threatened with harm, degradation, or extinction. We are aware of many organizations of international scope with missions of mercy, aid, assistance and technical services to reduce the stresses of daily living and survival itself.

Conservation organizations, agencies and institutes with national and international perspectives often focus on biodiversity and saving endangered species from extinction. Plants and animals, both terrestrial and marine, receive special attention from the Nature Conservancy, World Wildlife Fund and numerous other international, national and local organizations. Preservation of specific land and land uses, such as parks, forests, wild lands, deserts, mountains, lakes, rivers, urban green spaces and farmland all have advocates who encourage and regale us to participate in efforts to preserve such entities for future generations. At times we feel personal guilt that we are failing in a system that is struggling just to maintain itself.

So what's the problem now?

One aspect of humanity is the curiosity to explore our surroundings to discover more about our history and the pathways taken, to find unknown species that have not been catalogued, and reach further with more precision into the exactness of a universe of almost unimaginable proportions and components. Biotechnology research constantly informs us of a myriad of complex chemical transformations that open vistas never before imagined and with staggering potential possibilities to alter the course of future circumstances.

Almost a century ago as nations realized the enormity of having a 'one world' that could, or ought to, live in peace and harmony, the League of Nations (the forerunner of the United Nations), came into existence. Today most aspects of physical resources, products and production, food, environment and human and social interactions receive attention, although the list of concerns commonly outruns the funds and resources available.

All of the above situations have developed coping mechanisms – how to merge a galaxy of information, organize details, establish priorities and take action. Thus the human psyche seems to be the centre, the focal point, for solutions of coping mechanisms. Aha, it is a human problem. There are many more of us than ever before – but we don't seem to know whether more of us increase our ability to cope, or whether our increasing numbers dilute our effectiveness and capacity to provide meaningful coping solutions to the current dilemma.

Our 'commons'

Geologists and astronomers keep discovering disasters of monstrous proportions on time scales beyond our comprehension. Here on Earth changes have cycled and recycled for millions of years. Archaeologists uncover remains that help us interpret the ebb and

flow of calamities and tragic events that changed the course of human history. Today we are faced with a different challenge – a colossal challenge of likely upheaval and overthrow of the complexity created by unbridled growth of resource use that has brought us to the threshold between consumptive use and depletion of resources. Accelerating climate change is but one of the consequences of the world's exponential pattern of growth related to our actions that treat the world as a 'global commons,' where as individuals we work for profit, and as a group we forego the shared degradation until collapse is imminent. As more and more of us live without respect for our resources, and treat our system as a global commons, the faster we approach an unwelcome collapse. Professor Garret Hardin (1968) bluntly opined that ***"To couple the concept of freedom to breed with the belief that everyone born has an equal right to the commons is to lock the world into a tragic course of action."*** So here we are!

Is environmental degradation evil?

Population growth may be considered a problem with 'no technical solution' because a technical solution requires only a change in the techniques of the natural sciences and demands little or nothing in the way of change in human values or ideas of morality (Hardin, 1968).

"Although we live in a modern world dominated by science and technology, age-old beliefs in good and evil are still widely held and continue to be part of our daily lives. In every society, leaders urge people to seek good and to oppose evil. Everywhere judgments of what is good and what is bad are the most important judgments that people make and the most central to their lives. This view of the struggle between good and evil encourages people to believe in the evil of others" (Bell, 2004, p. 54). In this context evil can be thought of as human activities or interactions that harm other people. This involves a wide range of situations, from killing to verbally insulting someone. One type of harm is when people

use harmful acts to achieve a goal; the goal may be acceptable but not the actions used. Another type is when people commit violence against others and believe they are, in fact, doing the right thing. Revenge is an example of this type of evil whereby victims retaliate to right a wrong.

Where does soil conservation fit in the conflict of good and bad? Generally we believe that soil degradation is the loss or reduction of the proper functioning and balance of soil behaviour, therefore actions that cause degradation are wrong – in effect, they are evil. We speak of the need for stewardship of resources; it is the right thing to do, and suddenly we realize that soil conservation and the whole issue about a sustainable habitat is a "problem with no technical solution" – it is a morality issue with many facets.

Sustainability?

At the core of what lies ahead is the concept of sustainability. Obviously it represents many things to people, however, sustainability as we are beginning to comprehend the concept simply is humankind's need for harmony with the world – with the planet called Earth. A sustainable Earth in which humans are only components, important ones to be sure, but only components in a chain of events whose millennia are still unnumbered – is a vision that for most of us lies far beyond the obvious.

Energy has powered dreams and revolutions – time and again in human history as civilization developed agriculture, industry, nationalism and now globalization – each with a semblance of 'a commons' lulling the populace to overcome visionary reason with attitudes of more immediate gains and rewards. Oceans, the atmosphere and perhaps now space are realms being stressed by expanding populations and their long-standing belief in 'our commons' and it must be someone else's fault – for shame on them!

Sustainability must be a process, not a given condition because each action, each reaction, each behaviour and response has uncertainties. All forms of management in all endeavours appear to be 'risk managements' with unknowns and consequences yet to be realized. The Millennium Ecosystem Assessment (MEA) (Greenfacts, 2005) calls for active adaptive management that involves the design of management programmes to test hypotheses about how components of an ecosystem function and interact, thereby reducing uncertainty about the system more rapidly than otherwise occurs.

The challenge is to change

The challenge is to reconcile the demands for human development with the tolerances of nature (WRI, 2001). Most changes to ecosystems have been made to meet a dramatic growth in the demand for food, water, timber, fibre and fuel (fuel-wood and hydropower). Remember – from 1960-2000 the world population doubled. Our existing national and global institutions are not designed to handle the management of 'common pool' resources.

The MEA identifies indirect drivers of change as they affect the level of production and consumption of ecosystem services and the sustainability of production (Greenfacts, 2005). They are: population change including growth and migration, change in economic activity including economic growth, disparities in wealth and trade patterns, socio-political factors ranging from the presence of conflict to public participation in decision making, cultural factors and technological change. The current assessment states that many actions to slow ecosystem degradation do not address these indirect drivers. In addition to

addressing these drivers, they indicate that sets of responses must overcome some rather daunting barriers such as inappropriate institutional and governance arrangements, market failures and misalignment of economic incentives, social and behaviour factors, under-investments in development and diffusion of technologies and inefficient knowledge concerning ecosystem services and management.

One can easily conclude that the largest barriers, the major challenges, the most crucial concepts are how to facilitate change. If we ignore a problem, or those who perpetuate a given perspective, we will be ignored and it (they) will take over. History is full of situations where the masses did not raise their voices, their objections, nor take actions – and the world experienced the aftermath – often as armed conflict. Surely we are smarter than that! It is a mistake, said Professor Hardin (1968), to think we can control the breeding of mankind in the long run by an appeal to conscience.

Okay, let's go

The challenge is only global in the sense that each of us, as individuals, collectively comprise the humanity of our current civilization. It is necessary to take a different pathway so that ecosystem collapse can be averted and that sustainability in the broadest moral sense is an achievable goal. The real challenge, therefore, is individual – it is for me, it is for you. It is not the initial responsibility of your neighbour, nor the other city, or another country, or the UN organizations. Change must start with you and I. We can close our eyes, but it will not go away. Climate change is here, ecosystem degradation is occurring, the global pattern of consumption of resources is in an overshoot mode, and you and I, my friend – need to change. It concerns our values, ideals and morality as they dictate the future.

Is sustainability the overarching goal that civilization has been striving for throughout history? The world has always changed, sometimes faster and farther than at others, nevertheless it is a restless planet that we inhabit. Economic and social choices are based on perceptions and values that vary among places, times and participants, thus achieving sustainability depends mostly on social and economic factors. It is up to us to nurture the values and goals of wise resource management. Values provide meaning, and it is meaning that drives actions, so we must get our basic values right. A study by the United Nations University concluded that the major shared moral values in the world, regardless of culture, gender, age or other class are: honesty, compassion, fairness, responsibility and respect (Glenn and Gordon, 1999).

Professor Hardin (1968) once remarked that the essence of an argument cannot be photographed; it must be presented rationally in words. For example, the morality of an act is a function of the state of the system at the time it is performed. The fact that morality is system-sensitive seems to have escaped the attention of most codifiers of ethics in the past. The time is now, the system is ongoing and the consequences of our actions are crucial, exciting, and do-able.

> ***"Nobody grows old by merely living a number of years. People grow old only by deserting their ideals. Years may wrinkle the skin, but to give up interest wrinkles the soul"***
>
> ***Douglas MacArthur, US Army General***

Wisdom is related to the way we use knowledge. A wise decision inevitably includes value judgments, beliefs and feelings, as well as thoughts. It invariably involves moral

choices. If we want to have a better future, our first and most important task is to improve the quality and effectiveness of our learning. But wisdom is one thing; being wise is quite another. Being wise involves the ability to apply wisdom in practice; that is, taking actions. There are perhaps more issues connected to that jump from knowledge to action than are normally recognized.

> *"Don't be afraid to take a big step if one is indicated. You can't cross a chasm in two small jumps"*
>
> ***Lin Yutang, Chinese philosopher***

A pathway of change

An information format to achieve change is provided by a programme called CAP, Change Acceleration Programme (Wheeler, 2007). The following remarks are based on a PowerPoint training session explaining CAP.

Change is not like turning on a light. You can click the switch, but that doesn't mean that change has occurred, you've just clicked the switch. Change is something that occurs during a transition from the current state of things to the future state of things. It occurs as a process of adaptation, and it is facilitated by a set of steps and actions. Jack Welch, a former CEO of General Electric, once commented that change wouldn't be so difficult if it didn't involve people. The truth is that change is not an intellectual event. Change affects our relationships, our sense of ourselves and we have (sometimes very strong) feelings about all of that. The key to successful change is to have a comprehensive plan and to pursue it with discipline and vigour.

$$\text{Change} = f(VWXYZ) > \text{Resistance},$$

where VWXYZ are factors contributing to the pain of a current situation. Change takes place when the pain of 'what is' exceeds the perceived pain 'to change'.

It is true that learning is best when it is anchored in the learner's own experience. Thus the CAP process is a way to accelerate change by means of a structured format that helps participants relate to their experiences. The transition stage has two boundaries – one is leading change – that is, who, what and how the process is managed, and the other is changing systems and structures – that is the policies, practices and structures to make the change real and lasting.

The essential elements to move the process toward change are: (1) creating a shared need, (2) sharing a vision, (3) mobilizing commitment, (4) making change last (endure) and (5) monitoring progress and learning. Tools and techniques to carry out these steps are explained in the teaching materials for those interested in more details. If we truly believe in changing, there is much to be learned about successful techniques to assist the process along.

Voila! Stewardship

Yes, we have much to learn about taking care of this planet. The technical components of solutions are commonly the easiest to comprehend, design and implement. The

sociological components are less certain because they are deeply rooted in our traditions of morality and finding cultural and organizational acceptance in reasonable time frames often prove very difficult.

But the ingenuity, the dedication, and the resolve to change are characteristics of humans of which we all can be proud. Stewardship – that concept so near and dear to our hearts may be the key to the learning that overcomes the current resistance to change.

STEWARDSHIP is a word of 11 letters. These letters represent: Soil, Terrain, Ecosystems, Water, Air, Resources, Dependency, Sustainability, Harmony, Integrity, and People.

And when we bring all of them together we envision the power of our commitment to bring about lasting changes. We hope you are "going our way".

Remember that STEWARDSHIP is an acronym for:
Sustainability –Total Environmental Worth And Responsible Development;
Success – Honouring International Perspectives.

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The Landcare programme in Australia focuses on an integrated approach to dealing with the 'land protection' issues found there, such as soil erosion, land and water salinity, loss of biodiversity and the ravages of weeds and pest animals. Landcare has gone from strength to strength since it was established 20 years ago. Some 100,000 farmers and other landowners are members of Landcare groups across Australia. It also has a foothold in several other countries, including The Philippines, South Africa, New Zealand, Canada, the USA and some East African nations. Interestingly, there is a close link between soil conservation and the development of Landcare in Victoria.

The State of Victoria in southern Australia has a long history of wind and water erosion due to its diverse and variable climate and the extensive clearing of native vegetation carried out for mining and agriculture, mostly in the 100 years since the main flow of European settlement in 1850. Extensive winter cereal cropping is the main land use in drier areas, while sheep and cattle grazing dominate higher rainfall areas. Average annual rainfall across the State varies from 300 mm in the north-west arid areas to 1500 mm in the southern ranges. In addition, widespread droughts can occur once every few (5-8) years. During droughts and dry spells, wind erosion is common, particularly on the lighter sandy soils in drier areas. Overgrazing in other areas exposes soils to potentially devastating water erosion when the drought breaks, which it usually does with an autumn storm.

The propensity of the soils to erode was first noticed by European settlers in the 1840s on grazing properties. Gullies were developing on gentle drainage lines and these were enhanced with the finding of gold in the 1850s and the consequent rush to clear land for surface mining and cut timber for mining infrastructure. Unfortunately, many areas of interest to miners were also very fragile with highly dispersible clay soils. Much of central Victoria still shows signs of those gold rush days with old, but deep, gully erosion.

With further agricultural development, native vegetation was replaced with introduced European pasture species and cereal varieties (and farming practices) not particularly suited to this harsh environment. Most of the native vegetation now standing is on public land areas of roadsides, river frontages and protected in public forests and national and state parks. This rapid loss of native ground cover led to significant wind and

Eroded saline area in Victoria State, Australia.

water erosion throughout the State. After much discussion and agitation over many years, a State agency for soil conservation was finally established in Victoria in 1940, triggered by widespread wind and water erosion on farmland following a severe drought. Similar agencies were set up in other States in following years. The then Soil Conservation Board basically comprised a small policy and programme group that worked through other agencies dealing with agriculture, roads and rivers to get works done on the ground. It was, after all, during World War II and resources were tight. However the Board did develop extensive community education programmes and started running community based Regional Advisory Committees in 1941. The first field day was on the property of farmer D.H. Lawrence (not the author who did, by the way, visit Australia and wrote a novel called Kangaroo). Farmer Lawrence showed off the 80 km of contour furrows he had dug by hand to protect his sloping grassland. Because he believed that tractors and fuel at the time were needed for the war effort, he decided to use his own resources[1].

In 1949, the Soil Conservation Authority (SCA) was formed with power to develop its own workforce skilled in conservation engineering, advisory services and research and development. It continued the work of the Board and started developing a noticeable focus towards the causes of erosion, as well as dealing with the effects. Over the next decade significant changes occurred in the approach of the SCA to encourage farmers to repair soil erosion. Initial focus was on individual sites, but increasingly the farm as a whole was considered and whole farm planning (for soil conservation measures) was being implemented across the State. Surveys delineated soils, vegetation, erosion and land-use history across a property. Farmers were encouraged to look anew at the entire property and implement, if necessary, major changes to land use, relocating fence-lines

[1]Youl, R. (2006) (Ed.) Landcare in Victoria .Rob Youl. Melbourne. p 36.

to conform to land classes, undertaking various works and installing control structures. Building on this process, SCA staff saw that adjoining properties should be linked within a catchment where soil erosion had spread. Many farmers battled constantly to deal with neighbouring untreated eroding land, which threatened their good work. Safe disposal of excess water often required extensive graded waterways through several properties to the main creek bed or drainage line. This need for community co-operation to work on a broader scale was one of the building blocks of Landcare 30 years later.

Soil conservation policy and programmes also started considering other factors that were causal agents for soil conservation. Advice by field soil conservationists broadened over time to include the need for:

- Weed and rabbit control (wild rabbits were major destroyers of vegetative cover, both pastures and native plant seedlings).
- Strategic tree growing, to reduce the impact of land salinity.
- Farm-dam construction, to improve water supply and reduce gully erosion.
- Livestock management through land-class fencing, to reduce overgrazing on hilly areas.
- Land management in drought conditions (which occurs increasingly in many agricultural areas).
- Conservation cropping techniques, including low-till and no-till practices.

Soil conservation groups were formed based on small catchments and multi-farm programmes developed for what were called Group Conservation Areas (GCA). Over the next 20 years, about 150 GCAs were planned and implemented, in an effort to address the conflict between the actions (or inaction) of individual farmers, with the broader benefits to the farming community and downstream stakeholders achieved by good soil conservation practices. Darrell Brewin wrote:

"Conflict between individual farmers and society arises when the individual desires to maximize his personal satisfaction in a manner contrary to the benefits of society as a whole… The efforts of one individual farmer may be laid waste by the effects of erosion or high runoff from a neighbouring farm. A safe co-ordinated water disposal system for a whole catchment area is the cheaper and more effective base on which to build a conservation programme to control water erosion."[2]

Group conservation areas were planned technically by professional officers to repair existing erosion and to manage runoff to minimize future erosion. Various 'structures' – such as waterways, concrete chutes, contour banks – required engineering and surveying skills, and were the prerogative of the officer involved. To that extent, planning was primarily by the SCA officer, with little active participation by the farmers in the group. Farmers were naturally more interested in those practices – such as sowing improved pastures and fertilizing – that increased production. Co-operation between neighbours was needed and soil conservation advisors were trained in group extension techniques, including basic conflict resolution.

In 1983, the State Government amalgamated several agencies in land and water management, including the Soil Conservation Authority, the Forests Commission and the Vermin and Noxious Weeds Destruction Board. Each had an extensive field staff, which were

[2]Brewin, Darrrel (1980). Farmers' perceptions of soil conservation programs and soil conservation practices. SCA. Summary of the findings of a thesis for M.Agr.Sc. (Melbourne).

also amalgamated into regional groups. A policy and planning group – the Land Protection Service (LPS) – was developed to focus on programmes on soil conservation, weeds and pest animals, and farm tree growing. The LPS had a strong soil conservation component and it was charged by government with developing a new integrated, community group-based programme to protect and improve the land resources of the State. This was a logical extension of the soil conservation programmes that had been implemented through the Group Conservation Area projects since 1960. This new programme – Landcare – also took in the experience and ideas of some newer community-based tree planting projects dealing with the decline of rural trees in Victoria, repair of saline land and improvement in biodiversity. The emphasis on establishing a strong local group, the importance of local planning and the need to take an integrated approach to land protection issues were the key elements that separated Landcare from previous group activities.

Grassed waterway in cropland in Victoria State, Australia.

For further information, please see the 'Landcare Field Guide'. This is freely available at the following web site:

http://www.landcarevic.net.au/resources/publications/manual

Conversion factors for USLE–RUSLE between US and SI units

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In the original USLE publication of Wischmeier and Smith (1958) and in many later documents, values for soil loss, climate index and soil index are not dimensionless, but have either US or SI units. In many publications it is not well indicated which units are used. This causes much confusion and misinterpretation of data and hampers the predictive value of these models.

In the USLE model: **USLE: SL = CF × SF × TF × LUF,** where
SL = annual soil loss
CF = climate index = R
SF = Soil index = K
TF = Topographic index (dimensionless)
LUF = Land Use index (dimensionless).

Table 1 provides the correct US and SI units for the various units used in the USLE and RUSLE-2 models, as well as conversion factors. How these factors were calculated is indicated below:

SL = Annual Soil Loss
1 t (US) / (ac y) = 0.907 t / (0.405h × 1y) = 2.24 t/(ha y).

KE = Kinetic Energy per unit rain
1 (ft t (US)) / (ac in) = (0.304m × 907×9.81N) / (0.405ha × 25.4mm) = 2.63 10^{-4} MJ/(ha mm).

ΣKE = Kinetic Energy per shower
1 (ft t (US)) / (ac shower) = (0.304m × 907×9.81N) / (0.405ha × 1 shower) = 6.68 10^{-3} MJ/(ha shower).

I30 = Maximum 30 minutes intensity of rain
1 in / h = 25.4 mm / 1h = 25.4 mm/h.

ΣKEI30 = Erosivity per shower
1 (ft t (US) in) / (ac h shower) = (0.304m × 907×9.81N × 25.4mm) / (0.405m × 1h × 1 shower) = 0.17 (MJ mm)/(ha h shower).

ΣKEI30 = Erosivity per year
1 (ft t (US) in) / (ac h y) = (0.304m × 907×9.81N × 25.4mm) / (0.405m × 1h × 1y) = 0.17 (MJ mm)/(ha h y).

R = Climate index
1 (102 (ft t (US) in) / (ac h y)) = 100 × 0.17 (MJ mm)/(ha h y) = 17 (MJ mm)/(ha h y).

K = Soil index
1 h / (ft in) = 1h / (0.304m × 25.4mm) = 0.13 (t h) / (MJ mm).

Example:
In the case R = 100, K = 0.20 and TF and LUF are at their maximum values of 1, SL = 20 t (US)/(ac y). This is equivalent to 2.24 × 20 = 44.8 t/(ha y).

The same outcome can be obtained by first converting R and K into SI units: R = 17 and 100 = 1700 and K = 0.13× 0.20 = 0.026. Then SL = 1700 × 0.026 = 44.2 t/(ha y).

Table 1. Conversion table for US and SI units in the USLE and RUSLE-2 models

Terms used in USLE and RUSLE-2	To convert c1 into c2 multiply with:	Column 1 US units	Column 2 SI units	To convert c1 into c2 multiply with:
SL = annual soil loss	2.24	t (US) / (ac y)	t / (ha y)	0.45
KE = kinetic energy of rain	$2.63\ 10^{-4}$	(ft t (US)) / (ac in)	MJ / (ha mm)	$3.8\ 10^{3}$
ΣKE = kinetic energy of shower	$6.68\ 10^{-3}$	(ft t (US)) / (ac shower)	MJ / (ha shower)	$1.5\ 10^{2}$
I30 = max 30 min intensity	25.4	in / h	mm / h	$3.94\ 10^{-2}$
ΣKE × I30 = Erosivity per shower	0.17	(ft t (US) in) / (ac h shower)	(MJ mm) / (ha h shower)	5.9
Σ(KE × I30) = Erosivity per year	0.17	(ft t (US) in) / (ac h y)	(MJ mm) / (ha h y)	5.9
R = climate index	$17\ 10^{2}$	(ft t (US) in) / (ac h y)	(MJ mm) / (ha h y)	$5.9\ 10^{-2}$
K = soil index	0.13	h / (ft in)	(t h) / (MJ mm)	7.7

Greenhouse gas budget of soils under changing climate and land use (COST Action 639): Lithuanian expertise and problems

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Due to the significance of the Green House Gas (GHG) exchange between the atmosphere and soils, carbon changes in terrestrial ecosystem pools are included in international treaties (i.e. The Kyoto Protocol and UNFCCC). The issue of soils acting as a GHG sink is controversial, because in terrestrial ecosystems carbon (C) and nitrogen (N) occurs in several chemical forms and are potentially emitted as GHG. Cultivated soils have lost a substantial part of their original C and N as a consequence of anthropogenic use. GHG emissions due to land use change include those by deforestation, biomass burning, conversion of natural ecosystems to agricultural use, drainage of wetlands and soil cultivation. Considerable uncertainty exists regarding the sink strength of soils under different forms of land-use, especially under future

climatic conditions and in regimes of ecosystem disturbances, which are typical for many regions.

Co-operation among scientists and researchers across Europe was initiated with COST Action 639: 'Greenhouse gas budget of soils under changing climate and land use 'BurnOut' to solve such global problems'. The main Action objective is to improve our understanding of the management of GHG emissions from European soils under different land-uses and in particular disturbance regimes. The Action aims to identify gaps in previous projects, such as the response of C and N pools in soils under typical regimes of ecosystem disturbance and land-use change. To achieve our objectives, we will establish a communication platform between experts for different forms of land use, modellers and statisticians, and the contributors to the existing framework of GHG reporting.

To date, 24 countries have signed the 'Memorandum of Understanding (MoU) for the implementation of Research Action'. Lithuania signed the agreement to join the Action in May 2007. Appointed representatives on the Action Management Committee are member of the ESSC Council Dr Saulius Marcinkonis (Lithuanian Institute of Agriculture) and Professor Dr Habil Pranas Baltrėnas (Vilnius Gediminas Technical University).

Because Lithuania is dominated by agricultural landscapes (60% of national territory) and the agriculture sector contributes 21% of total emissions, questions over GHG exchange between the atmosphere and soils are especially important. Large areas of land have been improved (intensively fertilized, limed and drained), mainly during 1970-1990. Later changes in land cover (between 1995-2000) involved 2.5% of national territory and had most impact on agricultural and forest areas. The forest area increased in former territories of low productive arable land; also this was predetermined by forestation of forest swamps and depressions between hills and areas with old and dysfunctional drainage systems. Perennial grasslands and forestry may have important roles to play in attempts to reduce atmospheric CO2 levels, since countries may choose to account for forest management activities to fulfil their commitments under the Kyoto Protocol. Lithuania signed the Kyoto Protocol in 1998 and ratified it in 2002. Lithuania undertook to reduce its GHG emissions by 8% below 1990 levels during the first commitment period of 2008-2012. It is evident that Lithuania represents a unique experimental area for GHG budgets within soil research programmes. Furthermore, there are well-developed networks of long-term agricultural experiments throughout the country. These can contribute as unique sources of data for verifying GHG emission modelling results and explaining processes have not been covered by the default methodologies, due to lack of data.

There is still a paucity of information available about interactions between GHG stock in soil and human activity. These can result from both direct and indirect environmental disturbances. Direct disturbances include soil amendments with biosolids for reclamation of soil and regeneration of forest, and application of anaerobic digested manure on arable soils. Indirect disturbances include road maintenance using salts. Measurement of carbon-sequestration rates under additional salt loads and the accumulation of trace metals in different soil types is one of the specific aims of the COST Action.

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, 36 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.

Three new Ph.D. theses are reported in this issue.

Alar ASTOVER
Estonian University of Life Sciences, Tartu

Land use and soil management in Estonian agriculture during the transition from the Soviet period to the EU and its current optimization by the spatial agro-economic decision support system (2007). 144 pp. (ISBN: 978-9949-426-28-7).

The full thesis is available on the web at:
http://piksel.ee/emu/up_down/img/File/AstoverPhD.pdf

Abstract

Changes in arable land use in Estonia were caused by the socio-economic transition, but regional differences in the changes were influenced by local pedo-climatic conditions. The higher rate of decrease in the area under arable land use in 1992-2001 occurred in regions with low soil fertility. Plant nutrient balances of Estonian arable soils at the national scale were analysed over the long-term (1939-2003) using a uniform methodology. The application of fertilizers started to increase in the 1960s and peaked in the 1980s. The increase in fertilization was not followed proportionately by yield increases and this resulted in positive NPK balances of arable soils in the 1970-1980s, which has significantly improved the nutrient supply of arable soils. In the 1990s the use of fertilizers significantly decreased by several factors: N by six; P by 20; K by 30 and organic fertilizers by four. Plant nutrient balances of arable soils have become negative. Thus, at present, crop production takes place largely at the expense of the soil nutrient reserves created by farmers in the 1970-1980s. At present only 40-50% of the yield potential of cereals is realized in actual farming conditions. The high yield gap indicates the ineffective use of pedo-climatic resources and this is causing a deterioration in national agricultural self-sufficiency.

A positive effect of the collapse of Estonian agriculture has been a reduction of the pressure on the environment. However, there have been several negative effects on

the development of sustainable agriculture: (i) in soil degradation, due to insufficient investment in maintaining soil fertility, (ii) in ineffective use of pedo-climatic resources, (iii) in low profitability and competitiveness of the agricultural sector, and (iv) in decreased national food supply. To achieve more sustainable agriculture, the optimisation of agricultural land-use and soil management should be based on scientific knowledge. Thus, it is necessary to develop a spatial agro-economic decision support system (DSS). Data handling and presentation in the agricultural decision-making process was for the first time in Estonia embedded in field-specific GIS and its application possibilities were analysed in the example of Kullamaa rural municipality. A field-specific database was compiled and agro-economic models (using the example of spring barley) were applied to provide information (including optimal fertilizer rates, crop suitability indexes and profitability) for decision makers. The benefit of this DSS is that information from different sources is collected, processed and integrated into a unified system, which makes decision-making more effective. This also makes existing soil information more easily available and self-explanatory for stakeholders. Despite the fact that this study presents spatial agro-economic DSS using the example of just one rural municipality and a single crop, its importance is more extensive. Up-scaling the modelling results from field-level also enables its application in regional planning and in macro-economic analysis. In this study, the methodology for the functioning of the DSS was developed which is further applicable nationwide. Analysed spatial DSS serves as a basis for effective resource management in modern agriculture and can be used as a tool in knowledge-based decision-making processes to achieve economic, social and environmental targets of sustainable agriculture.

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PEDOLOGICAL AND HYDROLOGICAL EFFECTS OF VEGETATION RESTORATION IN EXCLOSURES ESTABLISHED ON DEGRADED HILLSLOPES IN THE HIGHLANDS OF NORTHERN ETHIOPIA (2006), 350 PP.

Abstract

Land degradation in the Ethiopian highlands includes several problems, such as degradation of the natural vegetation, soil erosion, loss of soil fertility and water stress. The alarming rate of desertification can be explained by the combined effects of several factors related to population pressure, such as deforestation, overgrazing, expansion of cropland, unsustainable use of natural resources and unbalanced crop and livestock production. In the mid 1970s, a start was made with large-scale soil and water conservation measures to halt and reverse land degradation. Besides physical constructions, like stone bunds along the contours and check-dams in gullies, also vegetation restoration was conceived as an option to fight land degradation and rehabilitate the natural environment. In this regard, the establishment of exclosures

originated in the early 1980s in different parts of Ethiopia as a promising strategy to rehabilitate degraded hillslopes. They are mainly established on steep, degraded areas in community land, where grazing and woodcutting are forbidden and other activities, such as the collection of grasses, is strongly regulated. Because of the clearly positive and rapid effect on vegetation recovery, exclosures became a popular and common practice, so that meanwhile, considerably large areas are closed (circa 12% in the study region). However, exclosures can also cause increased pressure on the remaining grazing lands and natural forests. Furthermore, as exclosures involve a loss of already scarce land and as they do not yield many tangible and material benefits so far, the measure is not always supported by local farmers.

Given the controversial nature of exclosures, it is very important to correctly assess the effects of the set aside policy on various aspects of the natural environment. Therefore, this study aimed at a better understanding of several pedological and hydrological effects of exclosures. This knowledge was then used to examine if, to what extent and how the exclosure practice can be applied for soil and water conservation.

Several pedological and hydrological effects of vegetation restoration were analysed by comparing exclosures of different ages among each other and against degraded grazing land, which is considered as the reference situation from where restoration commenced. From this it was clear that exclosures are a successful soil and water conservation technique. Their capacity to rehabilitate degraded land is reinforced if they are located below sediment and runoff source areas.

Fertile sediments, which are eroded in the sediment source areas and brought into exclosures suspended in the runoff water, are immediately trapped in the upper metres of the exclosure. Sediment deposition enhances the recovery of soil fertility in the exclosures and also helps to retain the sediments within a catchment.

Vegetation restoration results in increased litter production, organic matter accumulation and humus formation. Besides soil protection, these processes trigger soil structure amelioration and an increase in soil nutrient content. With respect to water conservation, the high infiltration capacity of exclosures is very important. On the one hand, it leads to higher soil water availability, with a corresponding rise in evapotranspiration and biomass production. On the other hand, high infiltration and the extended vegetative soil cover result in a considerable reduction of runoff from steep slopes, so that down-slope fields are less threatened by damaging floods. Where areas receive runoff, it is thanks to the capacity of exclosures to infiltrate large amounts of water that deep percolation and groundwater recharge is realized.

The capacity of exclosures to absorb soil and water not only results in rapid rehabilitation of degraded hillslopes. The filter effect of these vegetation strips also serves soil and water conservation at a larger catchment scale. Reduced water yields downstream is a drawback related to this.

Vegetation restoration plays a key role in the pedological and hydrological processes that were studied. This restoration triggers several ecosystem processes, which together result in the recovery of soil fertility and more efficient use of the available water. As such, higher biomass production is enabled, which governs a feedback mechanism, as it positively influences vegetation restoration.

An appropriate location of exclosures in the landscape can enhance the beneficial effects for land rehabilitation. The application of gully diversions in a selection of exclosure areas can further optimise this through water harvesting and increased sediment trapping. Sustainable use of the natural resources present in exclosures is necessary to secure the support of the local farmers for the conservation of exclosure

areas. As long as the balance between growth and harvest is maintained, controlled grazing, pruning, thinning, grass collection and honey production can contribute to sustainable use.

Publications

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Descheemaeker, K., Nyssen, J., Rossi, J., Poesen, J., Mitiku Haile, Raes, D., Muys, B., Moeyersons, J. and Deckers, J. (2006). ***Sediment deposition and pedogenesis in exclosures in the Tigray Highlands, Ethiopia.*** Geoderma 132, 291-314.

Descheemaeker, K., Nyssen, J., Poesen, J., Raes, D., Mitiku Haile, Muys, B. and Deckers, J. (2006). ***Runoff processes on slopes with restored vegetation: a case study from the semi-arid Tigray highlands, Ethiopia.*** Journal of Hydrology 331, 219-241.

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Spatial and temporal variability of the erosion resistance of loess-derived topsoils during concentrated runoff (2007), 242 pp.

(ISBN: 978-90-8649-113-1)

Abstract

Knowledge of the spatial and temporal variability in soil erosion resistance during concentrated runoff (SER) is indispensable for accurate predictions of soil loss due to rill and gully erosion. Information on soil erodibility during concentrated flow is scarce compared with the well-studied rill and interrill erodibility. Nevertheless, soil erosion during concentrated flow is responsible for the main part of the total sediment budget in the European loess belt. This dissertation aimed at explaining the dynamics of SER for loess soils, to allow the development of effective soil erosion control practices.

To determine SER, undisturbed topsoil samples were taken regularly on cropland in the Belgian loess belt and subjected to simulated concentrated runoff in a laboratory flume. Measuring soil and environmental characteristics contemporary with sampling allowed an explanation of the observed dynamics in SER. Some 64% of the observed variability in measured soil detachment rates can be predicted from flow shear stress and easy-measurable topsoil characteristics: initial soil moisture content, dry bulk density and the dry amount of roots and crop residues. Other factors affecting SER studied in this research include the effects of conservation tillage, vegetation, rainfall-induced consolidation and sealing and microbiotic crust development. When these factors are taken into account, the explained variability in soil detachment rates even increases to 78%. This knowledge on SER could then be linked to actually observed rill and gully incisions in the Belgian loess belt through field mapping. Both the incision points of rills and gullies and their dimensions are not only topographically controlled, but are as well determined by SER, and hence by soil characteristics.

In addition, a procedure to predict soil detachment rates in the presence of crop residues or vegetation, based on the recalculation of the hydraulic radius, was experimentally validated. This innovative procedure to calculate effective flow shear stress allowed explaining the erosion reduction in conservation tillage compared with a conventional ploughing system. Only a small part (circa 10%) of the difference in soil erosion for both tillage practices can be explained by the crop residues at the soil surface that slow down runoff. The improved soil structure under reduced tillage is responsible for the main part of the reduction in soil losses, implying that the effect will even increase in the long-term.

Finally, soil erosion control practices for rill and gully erosion, based on enhancing SER, were proposed and evaluated. Application of conservation tillage instead of conventional ploughing and the establishment of grassed waterways are very effective. Besides, small control practices, such as the stimulation or preservation of microbiotic crusts, double drilling and compaction of the thalweg, can already cause a considerable decrease in soil loss.

Publications

Knapen, A., Poesen, J., Govers, G., Gyssels, G. and Nachtergaele, J. (2007). ***Resistance of soils to concentrated flow erosion: a review.*** Earth Science Reviews 80(1-2), 75-109.

Knapen, A., Poesen, J. And De Baets, S. (2007). ***Seasonal variations in soil erosion resistance during concentrated flow for a loess-derived soil under two contrasting tillage practices.*** Soil & Tillage Research 94, 425-440.

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Knapen, A., Poesen, J., Galindo-Morales, P., De Baets, S. and Pals, A. (In press). ***Effects of microbiotic crusts under cropland in temperate environments on soil erodibility during concentrated flow.*** Earth Surface Processes and Landforms.

Knapen, A., Poesen, J., and De Baets, S. (In press). ***Rainfall-induced consolidation and sealing effects on soil erodibility during concentrated runoff for loess-derived topsoils.*** Earth Surface Processes and Landforms.

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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 would 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!" As a second contribution to these themes, recent Ph.D. graduate Nienke Bouma (Amsterdam) shares some of her perspectives with us.

Experiences and evaluation of Ph.D. research on different scales and locations

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Ph.D. Thesis Universiteit van Amsterdam
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The Netherlands, 317 pp
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(Abstract reported in ESSC Newsletter 2006/2)

My Ph.D. research consisted of several specific parts, i.e. thematic parts and practical research parts. The thematic parts were divided in rill erosion, physical soil properties and hydrology in agricultural soils and rill erosion, physico-chemical soil properties and hydrology in badland soils. Practically, the research was divided into writing the research proposal, collecting data, data assimilation, modelling, publishing and writing the thesis. This is mostly the work a Ph.D. student has to work through to get to graduation. Before evaluating these points, I will give an overview of the research and the framework within which the research was conducted.

Overview and scope of the research (rill initiation and development in relation to dynamic soil properties)

This research studied the initiation and development of rills influenced by certain specific soil properties, such as soil structure and consistency. The initiation of rills is a very complex process, as not only are rainfall and slope water conditions important, but also the way in which the soil or regolith changes their properties in response to wetting

during rainfall. Two areas were selected for studying rills. These were a natural badland area in south-east Spain and a cultivated loess area in South-Limburg, The Netherlands. The general aim of this study was to investigate critical conditions for the initiation and development of rill erosion in regoliths and soils with a high macroporosity in their topsoil (e.g. marl regoliths and cultivated loess soils). The most important research question was whether rill initiation and development is enhanced by the infiltration of water and specific dynamic soil properties.

A drainage theory derived from the theory of Hooghoudt and Donnan was studied in relation to rill initiation and development. The drainage model appears to be appropriate for ploughed loess soil, with a few adjustments being needed for the process of rill initiation. Large soil cracks, developed by tillage, appear to be highly important for the initiation of erosion channels on cultivated land. Combined with water-saturated soil, they cause loss of structure, which enables subsurface erosion to occur. For the badland regolith, the drainage model was not applicable and would need too many adjustments. I proposed an adjusted model for this area. The research was financially supported by 'The Netherlands Organization for Scientific Research'. It was not officially part of a larger project, however I co-operated with erosion projects in the Spanish badlands (DESERMA) and several erosion projects in Southern Limburg, The Netherlands.

Evaluating the research process, considering the several thematic and practical subjects

The subjects I studied (soil physics, soil chemistry and soil erosion) have their domains in different scientific areas. This is on one side one of the interesting part of the research, however practically on the other hand, it is one of the hardest problems to face. The interesting part is searching links between the different data sets to discover new processes.

The most difficult and challenging part is to find support from scientists within several scientific areas. It is important to convince them of your ideas and to show them the broad unlimited framework of your research. This is why I discovered that it is worth putting much effort into composing a scientific advisory committee. You can use regular meetings with this committee as a framework for planning your research. Another practical advantage of involving other scientists in your research is the co-operation in the field. Without the help of other people, I would not have been able to carry out the large complicated field experiments.

As Ph.D. research has so many different aspects to work with, scientifically and practically, it helps to approach it as a project and to see yourself as a project manager. This means that you cut the research into smaller subprojects with specific planning and links to the other sub-projects. It helps you clarify which decision to make before starting a new subproject.

As I mentioned before, my Ph.D. research consisted also of different practical components. As a scientist, it is interesting to put effort in all practical parts (i.e. developing experiments in the field and laboratory, developing ways to assimilate data, modelling data and processes and finally achieving the aim of the study in a synthesis). However, all different parts could be the subject of a Ph.D. thesis. So, especially in the case of experimental research, keep the aim of the research in mind. Do not be distracted by interesting sidelines. In the case of my Ph.D. interesting research sidelines were rainfall

simulation on badland slopes, soil physical experiments in badland soils and agricultural loess soils and modelling data in a spatial environment.

Finally, the writing part forces you to keep your goals clear. The most important aim of writing the thesis is to support your ideas scientifically, to make them clear to other scientists and to show the importance of your results for science and society.

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CONFERENCE REPORTS

International Conference on 'Forest Fires, Climate Change and Soil Properties,' Barcelona (Spain), 31 January-03 February 2007

This meeting was organized by Xavier Úbeda and Luís Outeiro, members of the GRAM (Group of Research of Mediterranean Environment) from the University of Barcelona and the Congress took place in the Faculty of Geography and History of this University.

The meeting had the financial support of the Spanish 'Ministerio de Educación y Ciencia' and the 'Agrupació d'Humanitats' of the University of Barcelona. Other organizations that supported this Conference included the ESSC, the 'World Association of Soil and Water Conservation', the 'Societat Catalana de Geografia', the 'Commission for Land Degradation and Desertification', the 'Sociedad Española de la Ciencia del Suelo', the 'ALINFO Network', the 'Grupo de Edafología Ambiental' and 'the International Journal of Wildland Fire'.

The aims: the Meeting explored issues concerning the effects of fire on soil properties. It is well known that fire and temperature produce changes to the physical, chemical, organic and biological characteristics of soils.

The background: the frequency and severity of forests fires have increased in the past decade, and this is a widespread worldwide phenomenon. It is important to understand the effect of high intensity fires and prescribed fire as a management tool on soils. It is hoped that the exchange of information will not only contribute to a better understanding of the effects of fires on soils, but also will suggest solutions for soil rehabilitation and management in terms of soil quality and forest regeneration.

A total of 107 scientists met in Barcelona from 18 countries. There were a total of 84 works and there were 44 oral communications and 40 poster contributions. Different specializations and affiliations of the participants in the meeting made an interdisciplinary and heterogeneous congress, with a variety of scientific and management issues. The contributions were placed in different topics and the were divided into five categories:

1. Fire Effects on Hydrology and Soil Physical Properties.
2. Fire Effects on Organic Matter Content, Soil Chemical and Biological Properties.
3. New Methodologies to Study Fire Effects On Soil.

4. Fire Intensity and Fire Severity Measurements.
5. Soil Recovery After Fires.

The Conference particularly focused on spatial and temporal scales (immediately after fire, short terms effects, medium and long term effects of fires and prescribed fires). The Congress also discussed processes at various scales, such as molecular changes, plot studies and catchments studies. The influence of forest fires and their intensity and recurrence in carbon cycling and climate change analysis, the use of models to predict the changes and the recovery after fire were items that were discussed in the conclusions of the Meeting.

One important conclusion is "how do scientific results and perspectives influence policy?" We explored effective ways to communicate the results of this Meeting to the forest authorities in particular and to society in general.

The Meeting also included an excursion to a study site where prescribed fire is used as a management tool (Les Gavarres Mountain, Girona). During the excursion the participants could talk with fire managers of the 'Generalitat de Catalunya' and owners of the properties that have been managed with prescribed fires.

The Congress had two key lectures: Stefan Doerr from the University of Swansea (UK) talked about "Fire effects on soil hydrological behaviour" and John Moody from the USGS and his lecture was entitled: "Linking runoff response to burn severity after a wildfire".

The Journal CATENA will publish a selection of the contributions in a special issue entitled: **'Fire Effects on Soil Properties.'** The guest editors of the special issue are Xavier Úbeda and Jorge Mataix-Solera.

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International Forestry Students' Meeting on 'Desertification Processes in Mediterranean Areas', 06-10 March 2007 in Palermo, Italy

The meeting was organized by AUSF-Palermo, University Forestry Students' Association, and supported by the University of Palermo, the Agricultural Faculty, the Sicilian Region, the Regional Councillorship on Agriculture and Forests, the Regional Councillorship on Tourism, the Regional Councillorship on Territory and Environment, the Province of Palermo and the Regional Forestry Service. It was the first IFSA meeting in the Mediterranean area focused on desertification. The IFSA (International Forestry Students' Association) is a worldwide organization bringing together forestry students from all over the world in a wide spectrum of activities. At the meeting there were over 60 students, representing local forestry students' associations, coming from several Italian cities and from others countries (Australia, Brazil, Germany, Poland, Serbia and Slovenia). In total, over 300 participants attended the meeting. The main part of the meeting took place in three days; the first day was devoted to the seminar and two others to field trips.

The opening ceremony of the seminar on 'Desertification Processes in Mediterranean Areas' (G.P. Ballatore Main Hall, Faculty of Agriculture, Palermo, Italy).

On Wednesday morning, 07 March 2007, the seminar on 'Desertification Processes in the Mediterranean Area' started. After the welcome speech of the Chairman, Professor Vito Ferro (President of the Interclass Council of Palermo Agriculture Faculty), in the opening ceremony Dario Vespertino (President of the AUSF – Palermo) stressed the role of forestry students' associations as an occasion of local, national and international students' aggregation, and pointed out how this meeting could be a good opportunity to change information and experience between students, researchers and institutions. Afterwards, three keynote speakers presented their lectures:

- Professor **José Luis Rubio** (President of the European Society for Soil Conservation) opened the lecture session with a rich and detailed presentation on 'Desertification and Forest Fires in the Mediterranean'. Professor Rubio explained the main characteristics of desertification, with its economic, ecological and social impacts. Regarding the role of forest fires, the audience was introduced to different approaches of research on the impacts of fires on soils and thus on desertification. The main impacts are the destruction of the organic layer, erosion and nitrification. The impacts of fires depend on fire temperature. The heaviest impacts are caused by fires with a temperature >450oC. He continued his lecture by explaining measurements for prevention of fires and intervention. Desertification is not an issue of broad public interest. In his conclusion, he expressed the needs to increase the perception of the desertification problem among European society and to decide a more adapted Mediterranean forestry policy, taking into account the desertification problem, maintaining landscape and biodiversity and ameliorating climate change.
- Professor **Marcello Pagliai** (President of the Working Group on Land Degradation of the International Union of Soil Sciences), introduced to the attendants the basic soil functions such as buffer and protective functions, but also elucidated the different socio-economic functions of soils. Such functions can have an inherent cultural heritage; soils are resources, and thus get consumed. Professor Pagliai continued his presentation by explaining the various aspects of soil degradation (such as erosion, compaction, organic matter impoverishment, salinization, sodification and impacts of human activities on soil) and provided figures about the degree of soils affected on different types of land-use. He concluded his lecture by emphasizing the importance of educating people on the correct use of soil and to persuade

farmers to adopt soil management practices able to prevent soil degradation, and showed possible synergistic effects between soil protection and other policy fields in Europe.

- Professor **Piermaria Corona** (President of ALIFOR; Italian Forestry Graduates Association) discussed the issue of 'Sustainable forest management and forest restoration to combat desertification'. At the beginning of his clear and thought-provoking lecture, he introduced the audience to the vulnerability of ecosystems and protective functions of soils towards deforestation, which is an issue of particular importance in the Mediterranean area. Desertification and climate change are strongly related in accordance with the recent IPCC (Intergovernmental Panel on Climate Change) Report. Although there is a clear shift towards more sustainability in Europe, there is a need to include forestry and its practices into a strategy for fighting desertification. He pointed out a number of key actions: distinguishing priority regions, adopting techniques to regional requirements, adjusting harvesting methods and reforestation, creating markets for ecologically relevant products with CDM being linked with both carbon sinks and combating desertification. It must be remembered that alternative technologies can improve the economic situation in the long term. At the end of his presentation he focused on the need for a long-term sustainable strategy to embrace environmental protection, economic efficiency and respect for social needs.

- On the second day of the Meeting, a technical excursion to Sparacia Farm was organized. This is an experimental farm, near Cammarata (AG – Sicily), related to the 'DESERTNET 2' Project. The excursion was led by Professor **Vito Ferro.** The Project is studying soil erosion and running a validation of the USLE under Sicilian conditions for the purposes of applying scientific and technological methods in combating desertification. The aim of the research is to find managerial solutions through new knowledge and operative suggestions.
- Excursion themes included:
- Measurement of soil loss.
- Measurement of rill erosion.
- Monitoring of erosive events within the experimental basins.
- Measure of the catchment discharge at the river basin scale.

The afternoon continued with an excursion through the nature reserve 'Macalube di Aragona', led by Professor **Tommaso La Mantia.** The area is famous for methane eruptions that occur approximately every 10 years, thus annihilating all vegetation cover and so disturbing succession and bringing it back to the primary stage. In the natural reserve, natives plants are used for controlling erosion and initiating re-naturalization .

Excursion themes included:

General standards for re-naturalization.

Ways to reconstitute the habitats, which have been degraded (maquis and garrigue areas).

Integrated management of agricultural and natural systems.

The second field trip was organized to the Mustigarufi artificial wood. The participants were introduced to the historical background of this plantation of rapidly growing species suitable for a warm climate, such as Eucaliptus camaldulensis and Eucaliptus occidentalis. It was initiated during the 1960s within the framework of a

programme for economic development. Nevertheless, the plantation is an example of the prevention of soil erosion. The excursion was led by Professor **Carmelo Dazzi** and Professor **Luciano Saporito.**

- Excursion themes included:
- Sicilian soils
- Soil erosion caused by anthropogenic activities in central Sicily.
- Soils that have been modified profoundly through human activities.
- Silviculture and its problems in central Sicily.

Desertification is an issue of increasing relevance for many countries of the Mediterranean area. Deforestation and ecologically unsustainable methods of soil utilization induce the process and call for reactions that must take the main aspects of these methods into consideration. In spite of the significance of the issue, the perception of desertification among European society and policy-makes is quite poor.

The Meeting successfully increased the awareness of future professionals in Europe towards the problem and contributed to a more enlarged view on forest policy at the community and pan-European levels. IFSA students, in the framework of the MCPFE, will try to participate in the development of strategies for sustainable development of forestry in their own countries.

Dario Vespertino, AUSF, Palermo, Italy
Adrian Valerius, IFSA, Freiburg, Germany

The participants of the technical excursion to the Sparacia Experimental Farm, Cammarata (AG), Sicily, Italy.

BOOK REVIEWS

None received.

BOOK ANNOUNCEMENTS

The following book was published recently:

Soil Erosion Research in Europe.

Edited by Katharina Helming, José Luis Rubio and John Boardman.
CATENA Special Issue, Volume 68, Issues 2-3, December 2006 (Elsevier).
ISSN 0341-8162.

Available online at: www. sciencedirect. com

Soil erosion by water and wind is among the major environmental threats related to agricultural and other land uses in Europe. Important European policies and directives, such as the Water Framework Directive, the European Commission Soil Thematic Strategy as well as instruments of the Common Agricultural Policy, such as agro-environmental measures, address the issues of soil erosion.

In the framework of the EUROSOIL Conference held in Freiburg, Germany, in September 2004, the ESSC was asked to organize a special symposium on soil erosion. The objective of the session was to provide a forum for soil erosion researchers in the field of soil science and to discuss perspectives and approaches to soil erosion research across Europe and beyond. The diversity of presented papers documented the multi-scale and multi-disciplinary aspects of soil erosion research. This special issue of CATENA contains 13 selected papers from that EUROSOIL Symposium and addresses a variety of regional perspectives across the Continent.

Contents:

Time and scale of gully erosion in the Jedliczny Dol gully system, south-east Poland
A. Schmitt, J. Rodzik, W. Zglobicki, C. Russok, M. Dotterweich and H-R. Bork
Gully development in the Moldavian Plateau of Romania
I. Ionita
Application of the SIte COmparison Method (SICOM) to assess the potential erosion risk – a basis for the evaluation of spatial equivalence of agri-environmental measures
D. Deumlich, J. Kiesel, J. Thiere, H. I. Reuter, L. Völker and R. Funk
Derivation of site-related measures to minimize soil erosion on the watershed scale in the Saxonian loess belt using the model EROSION 3D
A. Schob, J. Schmidt and R. Tenholtern
Modelling of snowmelt erosion and sediment yield in a small low-mountain catchment
G. Ollesch, I. Kistner, R. Meissner and K-E. Lindenschmidt
Erosion rates and nutrient losses affected by composted cattle manure application in vineyard soils in NE Spain
M. C. Ramos and J. A. Martinez-Casasnovas
Hydrological properties of Mediterranean soils burned with different fire intensities
O. González-Pelayo, V. Andreu, J. Campo, E. Gimeno-García and J. L. Rubio
The cost of soil erosion in vineyard fields of the Penedes-Anoia (NE Spain)
J. A. Martinez-Casasnovas and M. C. Ramos

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 309. 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.

As mentioned in the report on recent Ph.D. theses, 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, 36 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 2000 by an ESSC member to any of the Editorial team. We will then add the thesis citation details to the web site.

PAPERS

Booth, C.A., Baksiene, E., Fullen, M.A. and Ciuyns, A. (2007). Long-term agrochemical dynamics: engineering, application and challenges of calcareous sapropel as a soil fertilizer. International Journal of Ecodynamics 2(2), 1-9.

Descheemaeker, K., Muys, B., Nyssen, J., Poesen, J., Raes, D., Mitiku Haile and Deckers, J. (2006). Litter production and organic matter accumulation in exclosures of the Tigray highlands, Ethiopia. Forest Ecology and Management 233, 21-35.

Descheemaeker, K., Nyssen, J., Rossi, J., Poesen, J., Mitiku Haile, Raes, D., Muys, B., Moeyersons, J. and Deckers, J. (2006). Sediment deposition and pedogenesis in exclosures in the Tigray Highlands, Ethiopia. Geoderma 132, 291-314.

Descheemaeker, K., Nyssen, J., Poesen, J., Raes, D., Mitiku Haile, Muys, B. and Deckers, J. (2006). Runoff processes on slopes with restored vegetation: a case study from the semi-arid Tigray highlands, Ethiopia. Journal of Hydrology 331, 219-241.

Descheemaeker, K., Nyssen, J., Poesen, J., Mitiku Haile, Muys, B., Raes, D., Moeyersons, J., and Deckers, J. (2006). Soil and water conservation through forest restoration in exclosures of the Tigray highlands. Journal of the Drylands 1(2), 118-134.

Kertesz, A., Toth, A., Szalai, Z., Jakab, G., Kozma, K., Booth, C.A, Fullen, M.A. and Davies, K. (2007). Geotextiles as a tool against soil erosion in vineyards and orchards, p. 611-619 In: A. Kungolas, C.A. Brebbia and E. Beriatos (Eds) Sustainable Development and Planning III. Wessex Institute of Technology Press, Southampton.

Knapen, A., Poesen, J., Govers, G., Gyssels, G. and Nachtergaele, J. (2007). Resistance of soils to concentrated flow erosion: a review. Earth Science Reviews 80(1-2), 75-109.

Knapen, A., Poesen, J. And De Baets, S. (2007). Seasonal variations in soil erosion resistance during concentrated flow for a loess-derived soil under two contrasting tillage practices. Soil & Tillage Research 94, 425-440.

Staugaitis, G., Vaisvila Z., Mazvila, J., Arbaciauskas, J., Adomaitis T. and Fullen, M.A. (2007). Role of soil mineral nitrogen for agricultural crops: Nitrogen nutrition diagnostics in Lithuania. Archives in Agronomy and Soil Science 53(3), 263-271.

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, opportunities for research studentships, 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

Appointment of new Ph.D. research students

None reported.

Institutional movements and promotions of ESSC members

None reported.

ESSC membership list and contact details

The full ESSC membership list is held on the ESSC web site. Under 'members' you can get 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. Please send updated information to Zuzana Tekelová at:
E-mail: tekelova@vupu.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 does contain 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

International Scientific Conference Celebrating the 50th Jubilee of the Lithuanian Soil Science Society (circa) October-November 2008 in Kaunas, Lithuania

On behalf of the Board of the Lithuanian Soil Science Society (LSSS), we hereby cordially invite you to attend the International Scientific Conference Celebrating the 50th Jubilee of the Lithuanian Soil Science Society to be organized about October-November 2008 at the Lithuanian University of Agriculture (in Kaunas). We are pleased to announce the possibility to publish original research papers in the journal 'Agricultural Sciences', which is the periodical publication (four issues per year) of the Lithuanian Academy of Sciences. The scientific standard of all papers is maintained by the Editorial Board, which comprise scientists of the highest qualification: professors, habilitated doctors and academicians. Currently, the journal 'Agricultural Sciences' is indexed in CABI Publishing:
http://www.cabi.org/

In this connection, we ask those who might be interested in the above-mentioned publication to give us some simple initial information as soon as possible. This should include name(s) of the author(s) and title of the article (not exceeding 10 words). For the purpose of further planning, it would serve us as a useful indicator of your wish and willingness to prepare the paper for the journal.

In case you got interested, please, submit the requested information to us by e-mail to the LSSS Secretary:
rimantas.vaisvalavicius@lzuu.lt

Professor Dr Habil. A. Motuzas
Secretary of the Editorial Board of 'Agricultural Sciences'
and President of the Lithuanian Soil Science Society

Associate Professor Dr R. Vaisvalavičius
Secretary of the Lithuanian Soil Science Society

15th International Congress of the International Soil Conservation Organization (ISCO): 'Soil and Water Conservation, Climate Change and Environmental Sensitivity' 18-23 May 2008, Budapest, Hungary

Invitation

The Organizing Committee is pleased to invite you to attend the 15th Conference of the 'International Soil Conservation Organization' (ISCO) to be held in Budapest, Hungary, from 18-23 May 2008. The theme of the 15th Conference of ISCO is 'Soil and Water Conservation, Climate Change and Environmental Sensitivity'.

This topic will attract a wide range of experts, including scientists, university lecturers, policy makers and stakeholders from public and private institutions and non-governmental organizations throughout the world.

Hungary has a long and rich history of soil conservation, mainly because of salinization problems on the Great Hungarian Plain. The Country belongs to Eastern-Central Europe, where the change of regime after 1989 had serious implications for soil and water conservation. The central part of Hungary is very sensitive to environmental change, especially to extreme events like drought and flooding. Therefore, it provides excellent case studies for the theme of the Conference. Climate change is manifested in the growing frequency and greater amplitude of extreme events. Hungary provides good examples for a range of soil conservation problems and practices, including soil erosion by water and wind, salinization, compaction and water management problems of heavy soils. Research institutes, university departments and the soil conservation service network have been dealing with soil and water conservation problems for many decades, offering and ensuring solutions for these problems. Four days of oral and poster presentations and a mid-conference excursion will make the Conference an event always to be remembered for participants making contributions as presenters or participants in the discussions.

We are looking forward to welcoming you in Budapest in May 2008 at the 15th ISCO Conference.

Conference topics

- Climate change and environmental sensitivity.
- Land use change.
- Water management.
- Soil erosion.
- Salinization.
- Desertification.
- Other land degradation processes.
- Soil rehabilitation and management.
- Socio-economic aspects of land degradation.
- Legislative and institutional aspects of soil and water conservation.

Abstract submission

All interested persons are invited to give oral or poster presentations. In order for presentations to be included in the programme, it is required that at least one of the authors is registered at the Congress by the pre-registration deadline of 30 November 2007.

Venue

Budapest Congress and World Trade Centre (H-1123 Budapest, Jagelló út 1-3): http://www.bcc.hu

Conference languages: English, French

Conference fees

Registration fee

Pre-registration until 30 November 2007	€390
Normal Registration from 01 December 2007	€490

Conference dinner €60

Conference dinner for your accompanying person can be ordered and paid on site.
Participation fees of the **pre- and post conference tours** will be given soon.

Deadlines

Deadline for receipt of abstracts	30 June 2007
Notice of acceptance of abstracts	30 September 2007
Deadline for registration at reduced fee	30 November 2007
Deadline for receipt of papers	30 November 2007
Deadline for registration	30 November 2007
Publication of preliminary programme	15 March 2008.

For further detailed information, please see the ISCO 2008 web page: http://www.isco2008.com

EUROSOIL 2008
25-29 August 2008, Vienna, Austria

This is a co-operative venture between the 'European Confederation of Soil Science Societies' (ECSSS) and the Soil Science Societies of Austria, Croatia, the Czech Republic, Hungary, Slovakia, Slovenia and Switzerland.

EUROSOIL 2008 will comprise about 30 Symposia, four Workshops and numerous 1 to 3 day excursions in:

Central, Eastern, Southern and Western Europe.

More information can be obtained from the website of the European Confederation of Soil Science Societies (ECSSS):
http://www.ecsss.net or e-mail: winfried.blum@boku.ac.at

IX International Symposium on Gully Erosion, 17-19 September 2007, Pamplona, Spain

The Department of Projects and Rural Engineering of the Public University of Navarre (Spain) is pleased to invite you to participate in the 'IV International Symposium on Gully Erosion', to be held at Pamplona (Spain) from 17-19 September 2007.

MEETING THEMES

This Symposium aims to review current understanding and information on gully erosion by reporting progress in the following topics:

- Importance: e.g. on/off-site gullying impact on soil properties, landforms and landscape at different times and spatial scales.
- Characterization: e.g. experimental investigation on different kinds of gullies, monitoring techniques of gully erosion, historical reconstruction of processes.
- Controlling factors: e.g. effect of anthropogenic activities on gullying, interaction between gully erosion and other land degradation processes, the role of vegetation.
- Control measures: e.g. prevention of gullying, gully restoration methods.
- Processes and modelling: last but not least, we shall greatly appreciate receiving contributions on this important topic: e.g. gully headcut mechanics, channel network evolution and gully erosion thresholds.

SCIENTIFIC COMMITTEE

Carlos V. Alonso (USA), Gerardo Benito (Spain), Sean Bennett (USA), John Boardman (UK), Rafael L. Bras (USA), Rorke B. Bryan (Canada), Javier Casalí (Spain), Luisa M. De Santisteban (Spain), Florin Florineth (Austria), Rafael Giménez (Spain), Juan V. Giráldez (Spain), Gerard Govers (Belgium), Chi-hua Huang (USA), Mike Kirkby (UK), Yong Li (China), Javier López (Spain), José A. Martínez-Casasnovas (Spain), Jean Poesen (Belgium), Kerry Robinson (USA), Mathias J.M. Römkens (USA), Susana Schanabel (Spain), Aleksey Sidorchuk (Russian Federation), Andrew Simon (USA), Christian Valentin (France).

CONFERENCE VENUE

The Symposium will be held at the facilities of the Public University of Navarre, Campus de Arrosadía s/n, Pamplona, Spain, from 17-19 September 2007.

CONTACT DETAILS

For more details, please visit the Symposium webpage:
http://www.unavarra.es/erosion/index.htm

CONFERENCE TOPICS

(A) Natural Degradation Processes

1. Soil erosion (water and wind).
2. Impact of global change on erosion processes.
3. Landslides and rockfalls.
4. Torrents and torrential floods.
5. Hydrological processes.
6. Sediment transport and sedimentation processes.
7. Impact of soil erosion and sediment transport on water quality.
8. Monitoring of erosion and sedimentation processes.
9. Modelling of erosion and sedimentation processes.
10. Vegetation, biodiversity and slope stability.
11. Eco-engineering and land restoration.

(B) Erosion and Torrent Control Works: Watershed Management

1. Risk analysis and risk management of mountain hazards.
2. Erosion control works.
3. Soil conservation.
4. Torrent control works.
5. Sediment management.
6. Effects of erosion and torrent control works.
7. Wind erosion control.
8. Ecological engineering for erosion and torrent control.
9. Impact of land use on soil erosion and sediment transport.

(C) Social and Economic Aspects of Erosion and Torrent Control

1. Soil erosion and torrents as a social problem.
2. Economic effects of erosion and torrent control works.
3. Project management for soil and water protection.
4. Strategy for erosion and torrent control in view of the sustainable development of mountain regions.
5. Legal background and normative acts for erosion and torrent control.
6. Institutional aspects of erosion and torrent control.

Conference language

English will be the working language.

Conference organizer contact details

Professor Dr Stanimir Kostatinov – E-mail: kost@EUnet.yu
Professor Dr Nada Dragovic – E-mail: nadad@verat.net

Faculty of Forestry, University of Belgrade
Kneza Viseslava
11030 Belgrade
Serbia
Tel: 00 381 11 3553 122
Fax: 00 381 11 2545 485.

The 'Flood Repair Network' is pleased to draw your attention to the 'First International Conference on Flood Recovery, Innovation and Response' (FRIAR)

Venue: Institute of Civil Engineers (ICE) Headquarters, Great George Street, London, UK
Dates: 02 and 03 July 2008 (please note the revised dates).

This two-day Conference will provide a unique opportunity for Practitioners and Researchers to meet in order to exchange experience and ideas.

Scientific and technical sessions will provide an opportunity for the international flood repair community to share experiences and best practice. Themes will include flood repair, research, recovery, response, insurance and innovation in this field. A schedule of social events will also be offered.

The first call for Abstracts is currently being put into circulation, along with details of various advertising and promotional packages.

There is already significant interest in this event, so please register on our website. To obtain further details about this exciting project and to reserve your place, please visit our web site:
www.floodrepair.net

EPSRC
Engineering and Physical Sciences Research Council

2nd International Conference on Ground Bio- and Eco-engineering
The Use of Vegetation to Improve Slope Stability
Beijing, China, 14-18 July 2008

This Conference is the second in the series **'The Use of Vegetation to Improve Slope Stability.'** The first Congress was held at Thessaloniki, Greece, from 13-17 September 2004. In an era where more natural hazards are occurring; soil erosion, landslides and other catastrophic events cause loss of lives and infrastructure and major environmental damage. The aim of these meetings, therefore, is to bring together scientific researchers, practitioners, geotechnical and civil engineers, biologists, ecologists and foresters to discuss current problems in slope stability research and how to address those problems using ground bio- and eco-engineering techniques.

Ground bioengineering methods integrate civil engineering techniques with natural

materials to obtain fast, effective and economic methods of protecting, restoring and maintaining the environment. Eco-engineering has been defined as a long-term ecological strategy to manage a site with regard to natural or man-made hazards. Conference sessions will focus on an area where such engineering techniques are used increasingly frequently (i.e. natural and man-made slopes). Papers will be presented on slope instability, erosion, soil hydrology, mountain ecology, land use and restoration and how to mitigate these problems using vegetation. The mechanics of root-soil interaction are of utmost importance, along with the modelling of root reinforcement and the development of decision-support systems, areas where significant advances have been made in recent years. Proceedings will be published in a special edition of an international journal. We hope that you will be able to join us at this meeting, to be held in exciting Beijing, the 2008 Olympic City!

Organizing Committee:

T. FOURCAUD, CIRAD, Montpellier, France / LIAMA-CASIA, Beijing, China.
L. JOUNEAU, INRA Jouy / LIAMA-CASIA, Beijing, China.
H. LU, WASWC, Beijing, China.
Y. LU, Chinese Academy of Forestry, Beijing, China.
T. LUO, Institute of Tibetan Plateau Research CAS, Beijing, China.
J. NORRIS, Nottingham Trent University, Nottingham, UK.
I. SPANOS, NAGREF, Thessaloniki, Greece.
*A. STOKES, INRA, Montpellier, France / LIAMA-CASIA, Beijing, China.
X. ZHANG, LIAMA-CASIA Beijing, China.

*Conference Chair and for further information, please contact:

Alexia Stokes
LIAMA-CASIA
PO Box 2728
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Reminder for the next issue:

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).

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 for 2007 onwards are:

10 January	**01 April**
01 July	**01 October**

Some Closing Thoughts:

"The soil is the common mother of all things, because she has always brought forth all things and is destined to bring them forth continuously" (Lucius Collumella, 60 AD).

"The desert shall rejoice and blossom as the rose" (Isaiah, Chapter 35, verse 1).

"I will make the wilderness a pool of water, and the dry land springs of water" (Isaiah, Chapter 41, verse 18).

"The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it" (Michelangelo Buonarroli, 1475-1564).

"Black holes have the potential to create magnificent stars" (Anon).

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

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Membership rates:

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Account name: European Society for Soil Conservation;
Account number 001-4513980-64

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

NAME: .....

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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