NEWSLETTER

1/2007

ESSC EUROPEAN SOCIETY for SOIL CONSERVATION

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Cover photo: Holme Post was inserted through peatland in the Fens of East Anglia, near Peterborough, Cambridgeshire, England. The top of the post was level with the peat surface in 1848. The photo illustrates the huge amount of peat wastage that has occurred.
Photo by Mike Fullen.

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Contents

Outcomes from an International Workshop organized by the UK Soils Research Advisory Committee (SRAC), 26 – 27 September 2006

Editor's Note: Please see the Report on this Workshop in ESSS Newsletter 2006/3 (p. 37-39). This contribution summarizes the official views of the UK Soils Research Advisory Committee (SRAC).

The Workshop: context and process

The Soils Research Advisory Committee (SRAC) serves the UK Natural Environment Research Council (NERC) and Biotechnology and Biological Sciences Research Council (BBSRC). It has the brief to provide these Councils with an overview of soils research and its wider embedded role in other areas of science, and to promote awareness of the importance of soils and of their sustainable use and development. SRAC organized a workshop, held in London, from 26 – 27 September 2006, which aimed to examine and define novel and relevant areas of soils research and opportunities pertinent to the UK, set within an international context. This document provides a brief synthesis of the primary outputs from the Workshop.

The Workshop was attended by a self-nominated group of people, which was capped at 60 to ensure an effective dialogue. There was broad representation across the spectrum of research, policy and end-user communities, and at an international level, with attendees from Europe, the USA, Australia and New Zealand. The Workshop was structured on the first day by commencing with a series of invited keynotes, followed by an open 'brainstorming' session. On the second day, four groups were given a more structured brief to explore, built around research horizons in the context of the Millennium Ecosystem Assessment services. All outputs associated with these keynotes and discussion groups are lodged at:

http://www.iger.bbsrc.ac.uk/SRACWorkshop/welcome.htm.

Soils in perspective

- Soils are a crucial part of, and play fundamental roles in, the functioning of the earth system linking together the atmospheric, subsurface and aquatic environments.
- They underpin our civilisation and the economies that drive it.

- A study by Costanza et al.[1] calculated that ecosystem services that involve soil are estimated to be globally worth £22 trillion (1.8 x GNP) annually.
- In New Zealand, 17 % of the GDP depends upon just the top 150 mm of soil[2].
- Soils underlie all terrestrial ecosystem functions identified by the Millennium Ecosystem Assessment[3]. These encompass supporting, regulating, provisioning and cultural services.

- Soils provide key functions that may both drive and mitigate climate change, contribute to food, fibre and fuel security, furnish clean and plentiful water supplies and maintain biodiversity.
- However, the ability of soils to maintain these functions is under threat – they are non-renewable resources currently being unsustainably exploited.
  - Primary threats to soils include organic matter decline, compaction, salinization, landslides, contamination, sealing and biodiversity decline[4].
  - Under current practices, the timescales before many soils across the planet are irrevocably destroyed, and therefore unable to deliver the ecosystems goods and services dependent upon them, are judged to be tens of years to a century or so. History shows that civilisations that do not conserve their soils do not persist.

Soils are core to NERC and BBSRC missions, and to a wide range of funders, end-users and researchers beyond the immediate discipline. The policy drivers are myriad and well articulated, for example in 'Soil Action Plan for England' (Defra[5]), 'The State of Our Soils' (Environment Agency[6]), 'Scotland's Soil Resource' (SEERAD[7]), and recently the European Soil Thematic Directive (European Union[4]).

Stretching the Science

- The overarching scientific question is: **"How do soil systems function and interact with other components of the Earth's biological and environmental systems?"**

[1] Costanza et al. 1997 Nature 387, 253-260.
[2] Brent Clothier, 'New Horizons' presentation.
[3] maweb.org
[4] Commission of the European Communities, COM(2006) 232 final. Brussels 22 Sept. 2006. http://ec.europa.eu/environment/soil/index.htm
[5] Department of Environment, Food and Rural Affairs 2004. The First Soil Action Plan for England. http://www.defra.gov.uk/Environment/land/soil/sap/index.htm
[6] Environment Agency 2004. The State of Our Soils. http://www.environment-agency.gov.uk/subjects/landquality/776051/775200/775473/
[7] Scottish Executive Environment and Rural Affairs Department 2006. Scotland's Soil Resource - Current State and Threats. http://www.scotland.gov.uk/Publications/2006/09/21115639/0

- The target: Understanding **soil system dynamics –** develop a mechanistic and predictive understanding of how soils function, consistent with knowledge of other components of the Earth, such that we can manage them optimally in ecological, production and socio-economic terms.
- The scientific challenges:
    - Soils are one of the most complex systems on the planet: the basis for this complexity is that they are structurally heterogeneous across some 15 orders-of-magnitude in scale, support levels of biodiversity that far exceed any that prevail above-ground, show wide temporal variation in functional behaviour and support an extraordinarily complex chemistry.
    - This is a significant research challenge, but also an opportunity as a potent model system to understand the consequences of complexity. Soils offer a real opportunity to drive innovative thinking and experimentation, both in systems biology and the nature of complex systems generally.
    - The principal scientific challenge is that of conceptualization: *The primary missing link is the lack of a coherent theoretical/conceptual framework for soil behaviour that will serve to drive the challenging science needed and integrate extant and emergent research*. This is what we need to achieve as a UK and global community.
    - In addition to this, technological challenges prevail. There have been notable advances in methodologies for describing and quantifying many aspects of the constitution and function of soils across a range of scales, in all disciplines: for example X-ray micro-tomography; nano-scale secondary ionisation mass spectrometry (nanoSIMS) and scanning laser spectroscopy; high resolution environmental probes and analysers; remote sensing using unmanned aerial vehicles and latest-generation satellites adopting visible- and microwave-based imaging; molecular-level analysis of biological systems including genomics, proteomics, metabolomics and associated bioinformatics. However, there are still gaps in terms of non-invasive methods for studying soil function in an appropriate context at meaningful spatial and temporal scales.
    - As a consequence of a greater vision of the complexity of soil systems, it must be dealt with by a more effective trans-disciplinary dialogue, for example with physicists, engineers and resource economists.
- Goal: To realize such a framework that integrates a predictive family of models for soil function
    - This should be driven by targets focused on key issues. It was not a brief of the meeting to prioritise research issues, rather to consider the longer-term strategic view. However, each discussion group was tasked to select specific ecosystem services to use as case-examples in their dialogue. It was notable that understanding mechanisms that control soil C cycling and sequestration under climate change were highlighted by each group, and examples of requirements can be drawn up for all ecosystem services.

- It is in the nature of soil systems that there is a degree of connectivity between the range of processes that occur: this means that a more mechanistic, systems-orientated understanding will inevitably lead to better understanding of the wider range of functions and their feedback mechanisms.
- Contemporary earth-system models (climatic, atmospheric, hydrological) lack adequate integration of soil systems: this is a major limitation to overall progress, and needs to be addressed urgently.
- Plants are absolutely fundamental to food, fibre and biofuel production, and in most cases, grow in the context of soils. The biotechnology of plants will play a crucial role in aiding the development of a sustainable future, and therefore its application must be realized with due inclusion of soil system science.

Key Requirements

- Tools for the job: soils need to be studied as integrated systems in an appropriate context. This requires three sorts of frameworks:
  - o A conceptual framework as articulated above – this will provide the context in which research is carried out.
  - o An infrastructural framework that will ensure that there is coherence and consistency in soils that are studied, and in a more integrated context with other earth sciences.
  - o A social and economic framework within which the research is carried out – assured and effective communication between all the people involved with soil systems research is needed.
- Base knowledge: the soil resource needs to be audited and monitored, both from a policy-level context, which in itself raises some challenging scientific issues, and from the perspective of underpinning research. This must provide high-resolution, quantitative information across a wide range of spatial and temporal scales: from the local to national to global scales, and from the short term to the time-scale of climate change. The information must be in forms useful to a wide range of clients: from policy makers to Earth System scientists and social scientists. New advances in sensing technologies and geospatial and information sciences, make rapid progress in this possible.
- Many of the ideas outlined above are embodied in the concept of a 'Soil Observatory'. This concept may serve to provide a device to integrate across disciplines, sectors and funding bodies. The term is not intended to embody a single entity, nor necessarily solely a network of sites, but should include a sound theoretical framework – a unifying construct - that serves to focus research effort to make it more coherent and pertinent to the key questions. Development of this concept is an affirmed action subsequent to the meeting, and will be taken forward.

- The UK soils research community is in a reasonably fit state to realize these goals, notwithstanding some skills gaps. It is nonetheless enthusiastically focused on addressing contemporary and future issues to ensure the current and future health of the Earth's fertile and fragile skin. The definition of these is somewhat apocryphal but (as in many areas of science) appear to relate particularly to physics and chemistry, with evaluation and classification of soils, notably in a landscape context, also an issue.

The challenge now is to develop the frameworks and groupings that will enable novel broad-scale research to advance our understanding of soils as dynamic interactive systems. This will require intellectual and capital investment, building on existing infrastructure and contemporary programmes across the environmental and socio-economic spectrum, as well as developing new initiatives.

Scotland's Soil Resource – Current State and Threats

Willie Towers
Macaulay Institute
Craigiebuckler
Aberdeen AB15 8QH, UK

A Summary of a Report for the Scottish Executive by the Macaulay Institute and Stirling University, Scotland, UK

Background and Objectives

Within the UK, specific responsibilities have been devolved from the UK Government, based in Westminster (London), to the Scottish Executive, the devolved Government for Scotland, based in Edinburgh. Rural affairs and environment, including issues related to soil policy and protection, are among these devolved responsibilities. In developing their response to the developing EU Soil Framework Directive http://ec.europa.eu/environment/soil/index.htm, the Scottish Executive commissioned the Macaulay Land Use Research Institute and Stirling University to undertake a desk-based study to collate information about the state of Scottish soils and the pressures that affect their ability to support the range of vital functions upon which we rely. These include:

- Providing the basis for biomass production from agricultural and forestry industries in Scotland.
- Present and future existence of nationally and internationally valued habitats.
- Regulating our water supply and protecting it from contamination.
- Storing carbon.
- Sustaining biodiversity.
- Providing a foundation for buildings and roads.

The review is a critical assessment of the current evidence. The Report sets out to identify important information gaps and make suggestions and recommendations as to how these might be addressed.

Scotland's Soil Resource

Some important aspects of Scotland's soil provided the overall context:

- Soil is essentially a non-renewable resource and is fundamentally one of Scotland's most important assets.
- Scotland's soils are diverse and differ markedly, both in their inherent properties and the functions that they sustain, from those in the remainder of the UK and from many other European countries.
- Based on existing information, Scottish soils are generally of good quality.

Key findings

The report systematically and objectively reviewed the available evidence of the current status of Scotland's soils and the threats to these soils. On the basis of this review we identified both potential and actual threats to Scottish soils and issues pertaining to how we might collate information describing these. The key findings related to specific threats and on some wider issues are given below. The threats analysed are very similar to those outlined in the recently published proposal for an EU Soil Directive. Some recommendations were also suggested on how to fill knowledge gaps.

Loss of organic matter

There is some evidence that levels of organic matter in Scottish soils may be declining. If the findings of a large study in England and Wales are replicated in Scotland, this could represent a very significant reduction in the UK stock of terrestrial carbon.

Climate change

It is very difficult to predict what might happen to our soils given the uncertainty attached to climate models. The effects might range from direct impacts on key soil properties, for example, soil organic matter content to indirect ones that affect soil management.

Loss of Biodiversity

The diversity of life (invertebrates and micro-organisms) in soils is vast and unexplored. Soil biodiversity is therefore a true scientific frontier. The major impediment to evaluating any loss in biodiversity is the lack of systematic data that describes its current status, how it varies spatially and temporally as well as the key links between biodiversity and function. Work has already identified strong relationships between rare or valued habitats and rare and valued soils in Scotland and, in the short term, this offers the best opportunities of filling this knowledge gap. There is evidence that contamination by heavy metals may alter and reduce specific components of the microbial community.

Structural degradation and compaction

Although compaction and structural degradation does occur on cultivated soils, the incidence is localized and there is no clear evidence that these pose serious threats to soil quality nationally. In most circumstances the problem can be readily reversed.

Soil Erosion

Although soil erosion does occur on cultivated mineral soils and the impacts can be very visible and damaging, single events are confined to small areas. There is no clear evidence that it poses serious threats to soil quality and can be readily rectified. Erosion of organic soils is more evident and potentially could increase in frequency and severity under certain climate change scenarios.

Soil Contamination

Based on current evidence most Scottish soils are not heavily contaminated, but there is some emerging evidence that sewage sludge application may be having a negative impact on the long-term fertility of some soils. Some historic contamination of soil, for example from acid deposition, is showing some signs of recovery.

Soil sealing by construction and mineral extraction

Based on the evidence available, agricultural land is being developed at twice the rate as in the mid 1990s (Figure 1). Soil sealing by construction has a profound effect

on the ability of soils to perform other functions and is effectively irreversible. Based on previous data, this development is likely to have occurred on some of our most versatile and productive soils.

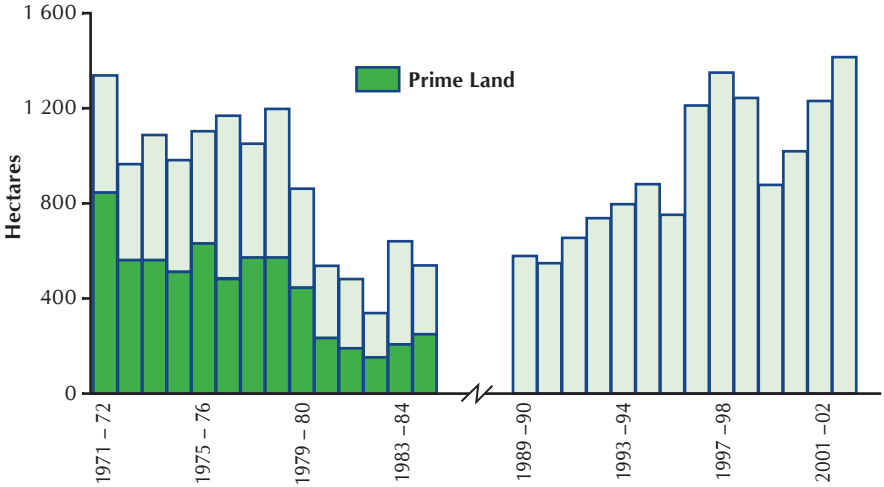

Figure 1 Land loss to the built environment in Scotland (1971 – 2003)

Cultural Heritage

Cultural soils occur in small areas and archaeological sites, although large in number, are not extensive. The main threats are from erosion and sealing by construction. Recent research indicates that cultural soils occur around more of Scotland's settlements than first thought. There is also evidence that our archaeological record has been reduced in number and extent over the last 150 years. Such losses are irreversible.

Salinization

The threat from salinization, which has been identified as significant in a European context, does not currently represent a significant threat to soils in Scotland.

Relative significance of threats to Scottish soils

A simple scoring system to rank threats according to their relevance to all soil functions. The attributes used in the system were:

- Consequence: What are the medium term (20 – 25 years) consequences of the threat or issue in relation to the six soil functions?
- Extent: – Does it impact at the plot, field, regional or Scottish national level?
- Reversibility: The extent to which the effects of the threat are naturally attenuated, can be mitigated, remediated or reversed?

- Level of uncertainty: How good is our understanding of the issue? How strong is the evidence base and data to support it?

Threats from erosion, compaction and contamination (other than acidification) were judged to be of localized significance, although they can lead to loss of important functions. They were also assessed as being relatively straightforward to rectify. Sealing, loss of biodiversity and acidification were scored more highly as threats nationally, with sealing affecting almost all soil functions. Climate change and loss of organic matter were identified as the most significant threats to soil functioning, although there is much uncertainty in the evidence here.

Key conclusions and recommendations

For a number of the identified threats, there is a lack or absence of data upon which to make robust conclusions. In particular, there is a lack of trend data from which evidence of change in, and damage to, our soils might be determined. This led to the recommendation that a soil information and monitoring system should be established for Scotland. This would provide the platform for the integration of existing and new data and the information necessary for environmental reporting. At the public launch of the Report, the Scottish Rural Affairs Minister, Mr. Ross Finnie, announced that the Scottish Executive were committed to the establishment of a Scottish soil monitoring system and to develop a soil strategy that will provide a framework for soil protection.

The full report can be accessed and downloaded from the Scottish Executive website at:

http://www.scotland.gov.uk/News/Releases/2006/09/25102611

Upland blanket peat represents one of Scotland's most important habitats and a major store of terrestial organic carbon.

Further information can be obtained from Willie Towers at the Macaulay Land Use Research Institute, Craigiebuckler, Aberdeen AB15 8QH , Scotland, UK.

E-mail: **w.towers@macaulay.ac.uk**.

I WANT TO LOVE YOU!

Dick Arnold, Soil Scientist (USDA-NRCS, Washington DC, USA; retired)
E-mail: **CT9311@aol.com**

If you do not fly or do not swim all the time – then soil has a role in your life. Soils are anisotropic earthy bodies that vary both vertically and laterally, and because our model of soil is fairly broad, it constitutes an ecosystem, an environment, a time and place in space. Soil variability takes years of study and research to understand and our lack of knowledge leaves much work to be done. Comprehension that soils take thousands and millions of years to develop their unique features helps us realize the significance of wise utilization. An access to land does not guarantee an access to other basic human needs. Some soil resources have little potential for agricultural use. Soils are neither good nor bad, for they judge not nor stand in judgment. That is our responsibility.

"The aim of education is knowledge, not of facts, but of values"

(William R. Inge)

It has been said that politics deal with urgencies, not with essentials. In the so-called developed countries most of us are used to the politics of plenty – you know, "a chicken in every pot" – the unquenchable demand for material goods and services. But how do you sell "a half-chicken in every pot" when global runaway economics mesmerize our daily lives?

As readers of this Newsletter we share with elected politicians the fear of a public that confuses the messenger with the message. I am beginning to understand what Walter Lippman, a noted American columnist, meant when he said *"we are living through the closing chapters of an established and traditional way of life. We are in the beginning of a struggle which will probably last for generations, and that is, to remake our civilization."* Wow, I think that challenge is too big – can't we leave it for the coming generations?

Lippman went on to say *"it is not a good time for politicians, it is a time for prophets and leaders, and explorers and inventors and pioneers, and for those who are willing to plant trees for their children and grandchildren to sit under."* He was telling us we need visionaries, champions, a resurgence of basic beliefs and a commitment to servant-leadership.

We are overwhelmed by the accumulating information of humankind's reliance on and its use and abuse of materials and services initiated by the Industrial Revolution and promulgated exponentially ever since. It is perhaps easiest to characterize our situation as 'the tragedy of the global commons'. The tragedy of the commons is a story about a community-owned pasture where individuals could freely graze their animals. Because each herdsman could profit from the sale of another animal, yet not be responsible for pasture degradation, soon the commons was overstocked, the pasture overgrazed beyond recovery, and the system collapsed. Our global resources are perceived to be held "in common" by all and so the tendency is to overuse them until collapse is imminent.

The Club of Rome, the World 3 model, the Earth Policy Institute and other economist and environmentalist groups have been providing simulations of what is happening, and outlining alternative outcomes based on their findings. What they have developed as 'essentials', that is, options for the future now seem to be in the realm of 'public urgencies' but not yet in the realm of 'political urgencies'.

Many of the current models of looming issues, such as exponential growth of population, food and energy demands and uncontrolled exploitation of material goods, show trends leading to the collapse of societies as we know them because without adjustment the problems continue to outrun the solutions. However, technological innovations tackle many aspects of existence – bigger and faster accession of data to be crunched into information, fantastic medical discoveries that someday may revolutionize life as we know it, discoveries in outer space and deep within our planet that enrich our appreciation of systems both old and new, and thousands of other snippets of information that tickle our imagination.

Sounds great doesn't it? Yet something vital is missing. What is absolutely essential to the "remaking of our civilization"? People are. We must know who they are, where they are, what they do, why they do it, and find out how they accept ideas that affect the inevitable changes that do occur. That's right – civilization is a people-thing – not a material resource-thing – not money, not food, not energy; but people – humans – more specifically it is you and me. Collectively we are the problem and collectively we must be the solution.

I enjoy ideas that give me a better perspective and that I am ready to consider – how about these attributes of human nature?

- We are self-centred, desire praise, and generally think of ourselves as winners.
- Our unmet needs deal with admiration, respect, dignity, integrity, excitement, and beauty.
- Our imaginative, symbolic thoughts are as important as our rational, deductive ones.
- Our conscious mind seldom holds more than six facts at one time, whereas our unconscious mind can accumulate many patterns and relationships.
- We are creatures of our environment.
- We are very sensitive and responsive to external rewards and punishment.
- We act as if our expressed beliefs are important, yet our actions speak louder than words, and
- We need meaning in our lives and will sacrifice a great deal to institutions that will provide meaning for us.

A plethora of books and enthusiastic evangelists expand and explain these ideas and often use them to affect our behaviour. Our churches, schools and governments are well recognized for their influences.

In 1987 the Bruntland Report 'Our Common Future' stated that a sustainable society is one that *"meets the needs of the present without compromising the ability of future generations to meet their own needs"*. Such a society, with a sustainable ecological footprint, would be vastly different from the one in which most people now live. In 1992 a group of world scientists sent a warning to humanity: *"human beings*

and the natural world are on a collision course". Here in the first decade of the 21st century we are using at least 20 % more resources than are globally available on a sustainable basis. We are in a large 'overshoot'.

In 2005 the UN Millennium Ecosystem Assessment indicated that the degradation of ecosystem services may grow significantly worse during the first half of this century and will be a barrier to achieving the Millennium Development Goals. The Goals are people-oriented and they provide hope to solve the fundamental problems of humanity; namely, poverty, unemployment and unmet needs. The Assessment is environment-oriented and shows that growth *per se* is a false hope to restructure our global system of civilization.

We have to change our attitudes. We have to act as individuals and as members of collective systems. Here are some common sense ideas, some generalities, about restructuring any system:

- Extend the planning horizon. Choose options more for their long-term costs and benefits.
- Improve the signals. Learn more about and monitor the real welfare of the human population and the real impacts of human activity on world ecosystems.
- Lessen response time. Look for signals that indicate when the environment or society is being stressed. Decide in advance what to do if problems appear. Educate in systems thinking.
- Minimize the use of non-renewable resources, such as fossil fuels, fossil groundwater and minerals.
- Prevent the degradation of renewable resources. Protect soil productivity, surface water, rechargeable groundwater and all living things.
- Use all resources with maximum efficiency.
- Slow and eventually stop exponential growth of population and physical capital.

"Can we move nations and people in the direction of sustainability? If we actually do it, the undertaking will be absolutely unique in humanity's stay on Earth"

(W.D. Ruckelhaus)

Interpersonal tools are more powerful, meaningful and essential than our scientific data gathering, systems thinking, rational analysis, computer models and clear expositions. Consider these: visioning, networking, truth-telling, learning and loving.

The vision is that of a sustainable global habitat with harmony among humans and the ecosystems of their sustainability. You can be a champion of that vision. Never lose sight of the brilliance and comfort it kindles for all of humanity.

Networking with others – our spouses, friends, colleagues, institutions and individuals everywhere – to share knowledge about sustainability – is truly powerful. We can tap into each other's strengths and knowledge and overcome weaknesses and misunderstandings. Never underestimate the changes that individuals can and do make.

We often know an untruth when we hear it. Such untruths are meant to manipulate, lull, or entice us, or to postpone action, justify a self-serving action, to gain or preserve power, or even to deny an uncomfortable reality. We are told that one of the most important tenets of systems theory is that information should not be distorted, delayed, or withheld. Lies corrupt and distort information systems. The truth enables us to make informed decisions.

Learning means the willingness to go slowly, to try things, and to collect information about the effects of actions including the crucial information that an action is not working. Whatever you do, be humble. No one can be free to learn, not even the world's leaders, without patience and forgiveness.

The deepest difference between optimists and pessimists is their position in the debate about whether human beings are able to operate collectively on a basis of love. If individualism and short-sightedness are the underlying causes of unsustainability then surely love and compassion institutionalized in collective solutions is a far better alternative. Finding the right balance between urgency and patience, accountability and forgiveness requires compassion, humility, clear-headedness, honesty and – that hardest of words, that seemingly scarcest of all resources – love.

Aurelio Peccei, the founder of the Club of Rome, observed that the humanity of our times must be capable of restoring within us .... love, friendship, understanding, solidarity, a spirit of sacrifice, conviviality and it must make us understand that the more closely these qualities link us to other forms of life and to our brothers and sisters everywhere in the world, the more we shall gain.

The world is too dangerous for anything but truth,
and too small for anything but love"

(Rev. William S. Coffin)

I TRULY WANT TO LOVE YOU! **SOIL: Sustainable Only If Loved.**

Acknowledgements

I sincerely thank those authors who I have plagiarized to bring you this collection of thoughts. They include:

Brown, LR. (2006). Plan B 2.0. Rescuing a Planet Under Stress and a Civilization in Trouble. Earth Policy Institute. W.W. Norton & Co., New York. 365 pp.

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Use of Composted Sewage Sludge as a Sustainable Technique for Soil Restoration

Florencio Ingelmo (CIDE, Valencia, Spain)

The 'EU Thematic Strategy for Soil Protection' comprises soil organic matter (SOM) decline as one of the eight identifiable threats to soil sustainability. Comprehensive and comparable data for the new enlarged EU (EU27) on SOM content is not available, but estimated organic carbon level in the topsoil derived from the European Soil Database shows that around 45 % of soils in Europe have a low or very low organic matter contents (i.e. 0 – 2 % organic carbon). Such estimates reveal that the problem of soils with very low and low SOM exists in particular in the Southern countries, where 74 % of soils have < 3.4 % organic matter.

Besides other reasons, such as climatic conditions, unsustainable human activities are the most relevant driving forces. Consequences of decline of SOM for soil fertility and soil ecosystems, such as release of greenhouse gases, loss of soil biodiversity, reduction of water infiltration due to changes in soil structure, hence higher flood risk and increased water erosion, are significant and need the development of scientific and technical research to assist prevention and remediation.

Several initiatives in CIDE on the subject, including the below one, indicates that under the dry Mediterranean climate, water erosion and wildfire cause continuous soil degradation, which reduces water infiltration, water holding capacity and water efficiency through modification of soil structure and soil aggregation. These effects, normally, were avoided with organic amendments of the soil surface.

Currently, there is a debate in EU countries on the disposal and recycling of the sewage sludge resulting from wastewater plant treatment. Discussion and debate are in progress on the use of sewage sludge in agriculture for soil fertilization or soil amendments by using directly or as a secondary raw material, such as compost. Certainly, treatment has significant effects on recycling OM and nutrients.

To model these relationships, the 'relative available water capacity index' (RAWCI) (rate of variation referenced to the content of available water in the control) of a coarse-textured soil amended or unamended with composted sludges, have been investigated in representative soil samples of Viver (Castellón, Spain) as an index of water use efficiency.

Under laboratory conditions, soil samples amended with three rates of composted sludges (0, 2 and 4 % w/w) were subjected to three energy levels of water-erosion (0, 100 and 600 J/ml) and two heat treatments (25 ºC and 500 ºC) in a randomized complete block experimental design.

In assays without and with heating, the level of water erosion significantly affected the RAWCI of the soil samples. For the soil samples eroded with 600 J/ml and heated at 25 ºC, the RAWCI increased 5.4 % without organic amendment and increased 38.3 % and 48.9 % with amendment at doses of 2 % and 4 %, respectively. For the soil samples eroded with 600 J/ml and heated at 500 ºC, RAWCI decreased 10.8 % without organic amendment and increased 19.8 % with the highest dose.

As an explanation of these results, the amendment of this silty sand soil at the rates of 2 and 4 % (w/w) increases soil organic matter (SOM) inside the micro-aggregates, and that diminished their breakdown by water erosion and slowed down their combustion by heating. In the unamended soil samples, SOM was concentrated around the particles of fine sand and silt plus clay, and that provoked their destruction by heating. These processes selectively affected the RAWCI, with a bigger increase for the amended than for the unamended soil samples.

As a consequence, the use of composted sludges should be considered as a long-term sustainable technology to restore degraded soil. The security of such technology is restricted by the biological and physicochemical characteristics of this organic amendment and mainly by their heavy metal content. The permissible heavy metal content of applied sewage sludges are restricted by both Spanish and EU legislation.

This work has been supported by Contract UVEG–FACSA (N/REF SCP/JP 21.223) within the main project: 'Integrated soil restoration in clay, sand and limestone quarries in Castellón (Spain). I.- Hydrophysical characteristics of degraded and sludge amended soils'.

We are happy to exchange experiences on the topic with other interested research groups.

Florencio Ingelmo
Departamento de Degradación y Conservación de Suelos,
Centro de Investigaciones sobre Desertificación, CIDE (CSIC-UVEG-GVA)
Camí de la Marjal s/n, 46470 Albal
Valencia
Spain
E-mail: florencio.ingelmo@uv.es

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, 30 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.

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

The following are the abstracts of four recent Ph.D. theses from Wageningen Agricultural University. The full text of these theses is available as a 'Tropical Resource Management Paper'.

For further information, please contact:

Dr. ing. Wim P. Spaan
Erosion and Soil and Water Conservation
Nieuwe Kanaal 11
6709PA Wageningen
The Netherlands
Tel: 00 31 317 482764
Fax: 00 31 317 486103
E-mail: Wim.Spaan@wur.nl

Aad KESSLER
Wageningen Agricultural University

Moving People – Towards Collective Action in Soil and Water Conservation: Experiences from Bolivian mountain valleys (2006), 195 pp.

(ISBN: 90-8504-476-6)

Abstract

Land degradation in the Bolivian mountain valleys has increased in the past decades, and many cropland fields have been abandoned. Although farmers are concerned and urgent actions are required, no serious widespread actions are undertaken. Several soil and water conservation (SWC) practices – mostly based on local knowledge – are available to control runoff and improve soil management. The challenge is how to motivate farmers to adopt these practices on a wide scale. Facing this challenge, the JGRC Project validated a strategy for executing SWC practices within a holistic framework of rural development. In the first phase of this 'logical strategy', the objective was to

lay a solid foundation for sustainable development: to motivate farmers (improve their future prospects) and achieve their genuine participation. Based on this foundation, in the second phase SWC and development activities were executed. Participation rates in SWC contests and in maintenance of practices were higher in villages where a solid foundation existed. Nevertheless, two years after project withdrawal, many farmers had lost motivation to continue with SWC. The main reason: the lack of a catalyst to keep the process going. Active involvement of municipalities in rural development is therefore indispensable; they must provide follow-up activities. This requires well-trained and motivated actors in municipalities. Moreover, micro-meso-macro linkages must work efficiently, with local experiences that feed sector-wide approaches for scaling-up SWC activities, and adequate strategies that support and motivate farmers to invest in sustainable land management. Moving people – at all levels – towards collective action in SWC; only then land degradation can be reversed.

Resumen

La degradación de tierras en los valles de Bolivia ha aumentado en las décadas pasadas, y muchos campos cultivables han sido abandonados. Aunque los campesinos están preocupados y se requiere de acciones urgentes, no hay acciones serias a gran escala. Varias prácticas de conservación de suelos y aguas (CSA) están disponibles para controlar el escurrimiento y mejorar el manejo del suelo. El desafío es cómo motivar a los campesinos para que adopten estas prácticas a gran escala. Frente a este desafío, el proyecto JGRC validó una estrategia para ejecutar prácticas de CSA dentro de un marco de desarrollo rural. En la primera fase de esta "estrategia lógica" el objetivo fue de cimentar un fundamento sólido para el desarrollo sostenible: motivar a los campesinos (mejorar sus perspectivas futuras) y lograr su participación genuina. Basado en este fundamento, en la segunda fase actividades de CSA y de desarrollo fueron ejecutados. Tasas de participación en los concursos de CSA y en el mantenimiento de prácticas fueron más elevadas en comunidades donde existía un fundamento sólido. Sin embargo, dos años después del retiro del proyecto muchos campesinos habían perdido la motivación para continuar con CSA. La razón principal: la falta de un catalizador para alimentar el proceso. El compromiso activo de municipalidades en el desarrollo rural es indispensable, ellos deben proveer actividades de seguimiento. Esto requiere de actores bien capacitados y motivados en los municipios. Además, enlaces micro-meso-macro deben funcionar eficientemente, con experiencias locales que alimentan a enfoques sectoriales para la ampliación de actividades de CSA, y estrategias adecuadas que ayudan y motivan a los campesinos para que inviertan en el manejo sostenible de sus tierras. Mover gente – a todos los niveles – hacia acciones colectivas en CSA; solamente así se puede revertir la degradación de tierras.

E-mail: Aad.Kessler@wur.nl

Vahedberdi SHEIKH
Wageningen Agricultural University

Soil Moisture Prediction: Bridging event and continuous runoff modelling (2006). 190 pp. (ISBN: 90-8504-533-9)

Abstract

Soil moisture is a key variable in most environmental studies, such as hydrology, agrohydrology, meteorology, climate change, soil erosion and non-point source pollution. For instance, the initial condition of soil moisture is one of the most sensitive parameters for the event based soil erosion and surface runoff generation models such as ANSWERS, EUROSEM and KINEROS2. Therefore, provision of accurate information of soil moisture is critical for simulation of surface runoff generation and soil erosion processes. The main objective of this research is to investigate the provision of spatially distributed values of initial soil moisture content close before a simulated rainfall event with distributed event-based models. The high spatial and temporal variability of soil moisture content hinders its accurate measurement at the right spatial and temporal resolution. Therefore, soil moisture modelling is usually used as an alternative method to generate the spatio-temporally distributed soil moisture data. During the past few decades there have been considerable progress in the conceptual understanding and mathematical description of soil water dynamics within the unsaturated zone. This progress has lead to the development of various soil water dynamic models with different levels of complexity, process description, data requirement and scale of applicability. This Ph.D. study conducted field experiments and modelling analysis for the experimental catchment of Catsop (0.42 km^2) in South Limburg, The Netherlands. It appeared that soil moisture measurement with TDR is prone to large errors, particularly in deeper layers of the soil profile. On the other hand, the thorough sensitivity analysis of LISEM showed that it is highly sensitive to initial soil moisture conditions. Therefore, various models with different levels of complexity and scale of applicability were applied to derive appropriate soil moisture data. Application of a hierarchical generalized additive model (GAM) for water balance modelling indicated that it can be used as an efficient tool for model identification at various spatio-temporal scales. Soil moisture prediction with the physically based SWAP model at various aggregation levels showed that it is an adequate model at the point scale only after optimization of the input parameters. Development and application of a simple spatially distributed water balance model (BEACH) indicated that it has comparable results with other the other soil water balance models. The performance evaluation of the various soil moisture models in this study showed that in spite of large differences in the complexity and structure of the models, the simulation quality is similar. This is partly due to the large errors in the observed hydrological data used for model evaluation. These errors are often so large that they overshadow any differences resulting from the differing capabilities of various models.

E-mail: v.sheikh@yahoo.com

Aklilu Amsalu TAYE
Wageningen Agricultural University

Caring for the land: Best practices in soil and water conservation in Beressa Watershed, highlands of Ethiopia (2006). 149 pp. (ISBN: 90-8504-433)

Abstract

Land degradation in the form of soil erosion and nutrient depletion is a major constraint to agricultural development in the Ethiopian highlands. Conservation programmes have extensively been carried out during the past decades to rehabilitate degraded areas and stop further degradation. However, the conservation measures introduced have not been sustained by most farmers and land degradation continues to be a problem. The main objective of this research was to examine soil and water conservation activities in the central highlands (Beressa Watershed) and identify the constraints and opportunities for better conservation intervention. Farmers' knowledge of erosion problems and their conservation practices, the determinants of sustained adoption of introduced measures, and the performance of currently used conservation measures were analysed in order to identify best conservation practices. The study was carried out in the context of the history of land use and farming activities, livelihood and socio-economic changes and past conservation interventions during recent decades. The results show a complex inter-linkage between farmers' livelihoods and soil and water conservation. Farmers were aware of erosion problems, as well as soil fertility changes and they applied a range of conservation practices against these problems. Such local efforts are, however, constrained by soil degradation, insecure land tenure, weak extension services and high fertilizer prices. Nonetheless, introduced measures faced problems of acceptance and have barely been sustained by the farmers. Participatory evaluation of SWC practices revealed that farmers consider a range of criteria while choosing best soil and water conservation practices. The results further indicated that conservation activities in the watershed are constrained by problems relating to the various levels of decision-making, viz. local/household, village/community and national/regional level. The research presents a framework with a set of enabling conditions in order to support and encourage local conservation activities, and thus realize sustainable land use.

Résumé

La dégradation des terres sous forme d'érosion et d'épuisement d'éléments nutritifs est une contrainte importante au développement agricole dans les montagnes éthiopiennes. Des programmes de conservation ont intensivement œuvré, au cours de la décennie passée, à réhabiliter les secteurs dégradés et à prévenir les zones à risque.

Cependant, les techniques introduites n'ont pas connu l'adhésion d'un grand nombre de producteurs et la dégradation des terres continue d'être un problème sérieux dans le pays. L'objectif principal de cette étude était d'examiner les activités de conservation des eaux et des sols (CES) dans les montagnes centrales du bassin versant de Beressa et d'identifier les contraintes et les opportunités pour une meilleure intervention. La connaissance des producteurs sur les problèmes d'érosion et de leurs pratiques en matière de conservation, les éléments pour une adoption durable des mesures introduites ainsi que les performances des pratiques de conservation actuellement utilisées ont été analysées afin d'identifier les meilleures pratiques de CES. L'étude s'est basée sur le contexte historique de l'utilisation des terres et des activités agricoles, sur le niveau de vie des producteurs et des changements socio-économiques intervenus après la décennie d'intervention des activités de conservation. Les résultats montrent une interdépendance complexe entre le niveau de vie des producteurs et les activités de conservation des eaux et des sols. Les producteurs sont conscients aussi bien des problèmes d'érosion que des changements de fertilité du sol et emploient une gamme de pratiques traditionnelles contre ce phénomène de dégradation. De tels efforts locaux rencontrent cependant de nombreux problèmes dont la dégradation des terres, l'insécurité de la tenure des terres, la faiblesse des appuis, et le prix élevé des engrais. Néanmoins, les mesures introduites pour faire face à ces problèmes ont été à peine soutenues par les producteurs. L'évaluation participative des pratiques en matière de CES a révélé que les producteurs considèrent une gamme de critères pour choisir les meilleures pratiques de CES. Les résultats ont indiqué que les activités de CES du bassin versant sont soumises à des problèmes liés à différents niveaux de prise de décision à savoir : au niveau local ou du ménage, de la communauté villageoise et au niveau régional ou national. La recherche suggère un cadre avec un ensemble de conditions afin de soutenir et encourager les activités locales de conservation pour ainsi réaliser une utilisation durable des terres.

E-mail: muksitay@yahoo.com

Karim TRAORÉ
Wageningen Agricultural University

Effects of soil amendments and drought on Zinc husbandry and grain quality in Sahelian sorghum (2006). 162 pp. (ISBN: 90-8504-437-5)

Abstract

In developing countries, short Zinc (Zn) supply is limiting both crop yield and human health. Improving Zn in staple foods and/or improved bioavailability of Zn from staple foods would greatly improve public health. It is therefore a major challenge to design cereal production techniques resulting in higher Zn mass fractions (MF) in combination

with a lower IP-6 MF. In northern Burkina Faso, soil and water conservation (SWC) and soil organic amendments (SOAs) techniques adopted by farmers have improved both water and nutrient availability. Using these techniques crop yield increased in the Sahel. Potentially, this improvement of yields may also improve Zn MF in the grains and/or bioavailability of Zn from staple foods. The main objective of the current Ph.D. programme was to investigate possible modifications of SOAs as practice by farmers, which increase both the quality and the yield of sorghum in the Sahel.

To fulfil the above objective a combination of farmers' field monitoring, on-farm research, on-station experiments and greenhouse experiments were carried out in 2002, 2003 and 2004. The experiments consisted of a full factorial design with the factors: organic soil amendments (compost or farmyard manure), Zn fertilizer and P fertilizer.

Sorghum grain and straw yields varied considerably between years and they were affected by soil types. But no differences were observed between organic amendment types. Zn and P application significantly increased biomass and grain yield but did more with P application. Interactions between P and Zn application were not significant.

Grain Zn MF and IP-6 MF increased with Zn or P application. Effects on both MFs were larger with compost than with farmyard manure and larger on sandy than on gravely soils. With the higher compost dose, both Zn and IP-6 were further enhanced. Timing of Zn application only affected Zn MF. The IP-6: Zn molar ratio decreased with Zn application and increased with P application, resulting in comparable ratios when no fertilizer was applied or when both fertilizers were applied simultaneously. Grain Zn MF of 50 mg kg^{-1} with an IP-6: Zn molar ratio of around 15 is possible with Zn and P application in years with adequate rainfall distribution during grain filling. The food quality of such grains can be further improved by degradation of phytate prior to consumption.

Résumé

Dans les pays en voie de développement, la carence en Zn limite le rendement des cultures et la santé humaine. L'enrichissement et/ou l'amélioration de la biodisponibilité en Zn des aliments contribueraient à l'amélioration de la santé des populations. De ce fait, la mise au point de techniques de production capables de générer des récoltes avec des teneurs élevées en Zn et faible en IP-6 est un défit pour ces pays.

Dans la zone nord du Burkina Faso, l'adoption de techniques de conservation des eaux et des sols et des amendements organiques a amélioré la disponibilité en eau et en éléments nutritifs. Grâce à ces techniques le rendement des cultures a nettement augmenté dans le sahel. Potentiellement, l'amélioration des rendements pourrait être accompagnés d'une amélioration de la teneur ou de la biodisponibilité en Zn des aliments. L'objectif principal du présent programme Ph.D. a consisté à étudier les possibilités de modifications des amendements organiques tels que pratiqués par les producteurs afin de mettre au point des amendements capables d'augmenter la qualité et le rendement du grain de sorgho au sahel. Pour atteindre cet objectif, des enquêtes terrains et des recherches en milieu paysan et en serre ont été conduites en 2002, 2003 et 2004. Les expérimentation ont consisté en des essais factoriels composés de amendements organiques (compost et fumier), fertilisation en Zn en P.

Les résultats ont montré des rendements sorgho grain et paille très variables selon les années et affectés par le type de sol. Aucune différence significative n'a été observée entre les types d'amendements organiques. L'application du Zn et du P a significativement augmenté les rendements en biomasse et grain du sorgho avec un impact plus important pour le P. L'interaction entre le Zn et le P n'était pas significative.

Les teneurs des graines de sorgho en Zn et en IP-6 ont augmenté avec l'application du Zn et du P. La teneur en ces éléments était plus large pour le compost que pour le fumier et plus large pour les sols sableux que pour les sols gravillonnaires. La forte dose de compost a augmenté la teneur en Zn et en IP-6 pendant que la période d'application du Zn a influencé seulement la teneur en Zn. Le ratio molaire IP-6 : Zn a diminué avec l'application du Zn et augmenté avec l'application du P ce qui résulte en des ratios comparables lorsque aucune fertilisation minérale n'est apportée ou lorsque le Zn et le P sont simultanément appliqués. Une teneur graine en Zn de 50 mg kg^{-1} avec un ratio molaire IP-6 : Zn autour de 15 est possible avec l'application du Zn et du P pour les années avec distribution adéquate des pluies pendant le remplissage des graines. La qualité de la nourriture de ces graines pourrait être améliorée par la dégradation des phytates avant la consommation.

E-mail: karim_traore24@yahoo.fr

Endla REINTAM
Estonian University of Life Sciences, Tartu

CHANGES IN SOIL PROPERTIES, SPRING BARLEY (*HORDEUM VULGARE* L.) AND WEED NUTRITION AND COMMUNITY DUE TO SOIL COMPACTION AND FERTILIZATION ON SANDY LOAM STAGNIC LUVISOLS (2006). 160 PP. (ISBN: 13-978-9949-426-18-8; ISBN: 10-9949-426-18-9)

Abstract

As a result of changed soil parameters, effects on plant growth are mostly presented as impacts on cultural plant production, especially on yield. There are insufficient experimental data about soil compaction effects on plant nutrition on compacted fields. The aim of this work was to investigate the nutrient content and uptake of spring barley (*Hordeum vulgare* L.) and weeds in relation to soil compaction. Data were collected from the research field of the Estonian University of Life Sciences (58°23´N, 26°44´E) on a sandy loam Stagnic Luvisol in the years 2001-2005. Using a MTZ-82 tractor (with front loader; total weight 4.9 tonnes) soil compaction was performed before sowing time in spring 2001, 2002, 2003, 2004 and 2005. The traffic was applied uniformly to cover the entire experimental plots: 1 time, 3 times and 6 times. Four levels of a

complex fertilizer (N20: P3.5: K10) were applied at rates of $N_0P_0K_0$, $N_{40}P_7K_{20}$, $N_{80}P_{14}K_{40}$, and $N_{120}P_{21}K_{80}$ before drilling in the years 2003 – 2005. No herbicides were used for better investigation of the effects of compaction on weed species. Nutrient contents (N, P, K) of soil and plant shoots and roots were measured.

Compaction by a 4.9 Mg tractor had significant effects associated with the first pass in the topsoil (0 – 20 cm), but did not cause any changes in subsoil physical properties in the first few years. But after three years of compaction by six passes, a hardpan formed below the plough layer. On average, no significant changes in soil bulk density and penetration resistance were detected between one and three passes over five years of measurements. After five years following compaction without fertilizers, there was a significant positive effect on organic C, total N and available K content. At the same time, growing spring barley as a monoculture and without fertilizers decreased the content of all investigated nutrients in soil. By use of fertilizers, there was tendency to increase the mobile K and P content in soil due to compaction. Without fertilizer use, the productivity of barley was decreasing rapidly over time. Second year barley monoculture dry weight decreased by almost three fold and shoot density by 1.5 fold. In the third year, the mass and density of barley stabilized. Fertilization reduced the harmful effects of soil compaction. However, the agronomical effective amount of fertilizers was 260 $kg.ha^{-1}$, while the economically effective amount was only 2 $kg.ha^{-1}$ on most compacted soils. Soil compaction decreased and fertilization increased nutrient (N, P, K) content in barley and weed dry matter. At the same soil bulk density where nutrients content started to decrease, the cellular fluid pH started to increase. The crossing point of those lines indicated the critical value of soil bulk density for barley growth; which was from 1.56-1.60 $Mg.m^{-3}$, depending on weather conditions during the experimental year. Twenty-eight weed species were found on the experimental area during the five-year experiment. The most widespread weed species were: *Chenopodium album* L., *Thlaspi arvense* L., *Fumaria officinalis* L. and *Stellaria media* (L.) Vill. in the first years. The increase of the density and mass of *Spergula arvensis* L. and *Plantago major* L., species tolerating dense soils, were detected in the weed community, especially on the six-times compacted soil already after two years following soil compaction. In general, weeds formed < 35 % of the above-ground biomass of the plant community in all compaction and fertilization treatments. Most investigated weed species had higher N, P and K content in their shoots than spring barley, especially *Chenopodium album* and *Spergula arvensis*.

Changes in weed community and plant nutrition merit further investigations to better understand plant-soil and plant-plant interactions of other cultural plants and soils under stress conditions, such as soil compaction.

Further information:

A Dissertation for the degree of Doctor of Philosophy in Soil Science.

The dissertation is a summary of the following papers:

I Reintam, E. and Köster, T. (2006). The role of chemical indicators to correlate some Estonian soils with WRB and Soil Taxonomy criteria. Geoderma 136, 199-209.

II Reintam, E., Kuht, J. (2004). Soil compaction effect on soil, nutrient cycling and weeds in the agroecosystem, p. 519-527 In: W. Leal Filho and A. Ubelis. (Eds.) Integrative Approaches towards Sustainability in the Baltic Sea Region. Environmental Education, Communication and Sustainability 15, Peter Lang.

III Reintam, E. and Kuht, J. (2003). Changes in nutrient uptake and cellular fluid pH of spring barley as affected by soil compaction. Indian Journal of Plant Physiology, Special Issue, 522-526.

IV Reintam, E., Kuht, J., Loogus, H., Nugis, E. and Trükmann, K. (2005). Soil compaction and fertilization effects on nutrient content and cellular fluid pH of spring barley (*Hordeum vulgare* L.). Agronomy Research 3(2), 189-202.

V Reintam, E., Kuht, J., Trükmann, K. and Rääts, V. (2006). Soil compaction and fertilization effect on weed community and nutrient uptake on spring barley field. In: R. Horn, H. Fleige, S. Peth and X. Peng (Eds) Soil Management for Sustainability. Advances in GeoEcology 38, Catena, 157-164.

VI Reintam, E., Kuht, J., Trükmann, K. and Puust, J. (2006). Composition of weed community depending on soil compaction in barley field, p. 541-552 In: W. Leal Filho, A. Ubelis, D. Berzina (Eds) Sustainable Development in the Baltic Sea and Beyond. Environmental Education, Communication and Sustainability 23, Peter Lang.

VII Reintam, E., Kuht, J., Trükmann, K. and Leal Filho, W. (2006). Effect of annual lupines growing on compacted sandy loam Stagnic Luvisol. Archives of Agronomy and Soil Science 52(2), 171-181.

Supervisors:

Associate Professor Jaan Kuht and Professor Raimo Kõlli D.Sc. (Estonian University of Life Sciences).

Opponent:

Professor Dr Rainer Horn (Institute of Plant Nutrition and Soil Science, Christian Albrecht's University, Kiel, Germany).

Defence:

8 December 2006 at 10:00 at The Estonian University of Life Sciences, Kreutzwaldi 64.

E-mail: endla.reintam@emu.ee

Editor's note: At the ESSC Council meeting in Lleida 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? In short, please tell us "what I know now, which I wish I knew then!" We initiate this process with an invited contribution from Dr Madhu Subedi.

Experiences of Conducting Ph.D. Research in China

Madhu SUBEDI
School of Applied Sciences
The University of Wolverhampton WV1 1SB, UK

Madhu SUBEDI (2006)

Effectiveness of an agricultural technology research and development project for increasing the sustainability of cropping systems in upland areas of Yunnan Province, China. Ph.D. thesis, The University of Wolverhampton (UK), 375 pp. (Abstract reported in ESSC Newsletter 2006/1)

I obtained my Ph.D. from University of Wolverhampton, UK. The title of my study was 'Effectiveness of an agricultural technology research and development project for increasing sustainability of cropping systems in upland areas of Yunnan Province, China'. My project was based on a case study, i.e. evaluation of an EU funded agriculture research and development project (SHASEA, http://www.wlv.ac.uk/science/environment/SHASEA/), in Yunnan Province, China. I identified good and poor practices of research and development projects implemented in the past, especially in my native Nepal. While carrying out this study, I gained knowledge about the factors necessary to lead to sustainable impact from research and development projects. I have also analysed the elements responsible for the successes and failures of the Project. This study helped me to expand my knowledge and experience about soil and water conservation, natural resource management and sustainable development issues in South Asia.

This Ph.D. programme was full of joy for me. I had the opportunity to visit different places, receive very good co-operation from everyone involved and enjoyed the unbeatable hospitality of Chinese colleagues and farmers during my field studies in China. Despite the fun and joy, how successful was I in my main mission, i.e., my research project? In this note, I have tried to look back and share my feelings on the question: if I could have done my work any better?

Background: The SHASEA Project and my study

The SHASEA Project was implemented at a catchment scale with the twin objectives of increasing crop productivity and achieving this in a more sustainable and environmentally-friendly way. INCOPLAST (Integrated Contour Cultivation, Polythene and Straw Mulch Treatment) was designed as an innovative practice to achieve both objectives: increasing both crop productivity and sustainability. The latter was also addressed through additional measures at the catchment level. In all, seven agricultural technologies and development interventions (i.e. contour cultivation, polythene mulch, straw mulch, intercropping, irrigation, sweet chestnut and prickly ash tree planting) were tested/introduced in the Project catchment, together with several engineering measures.

SHASEA Project activities were expected to have impacts at three scales, viz. plot, household and community/catchment levels. The biological effects of the changed cropping systems at plot level were studied during the Project. This study was designed to consider not only the socio-economic effects of SHASEA activities on household and community/catchment levels after the Project period, but also to study the likely adoption and adaptation of Project technologies in future. A key part of this approach was to study these aspects from the perspective of the local stakeholders, especially farmers. Therefore different survey methodologies were considered, taking account the nature of the information required, the respondents and the purpose of the information. Extracting the views of these stakeholders, particularly farmers, is challenging in China, mainly due to difficulties in communication and the socio-political situation, so it was necessary to verify the information collected from one source with other sources. Consequently, a multi-approach participatory evaluation study was designed, involving different participatory tools/techniques, such as household interview, PRA group discussions, farmers' workshops, discussions with key informants and subject matter specialists and direct observations.

The challenges and insights from conducting research in China

While evaluating the SHASEA Project, I was successful in abstracting farmer-perceived successes/strengths of the Project. Farmers of Kelang village were highly capable of identifying the benefits of cropping technologies and environmental measures in the catchment using scientific indicators. This indicates their potential to work in collaborative ventures for cropping system improvement and soil conservation. However, they were very reluctant to point out the weaknesses of the

Project, and very reserved and hesitant to provide critical comments. Despite the repeated request for critical comments about the Project and to put forward Project weaknesses (which would provide a basis for future improvement), farmers tried not to give any negative responses, particularly when the matter was discussed in groups (possibly in front of outsiders/foreigners). Generally, Chinese people seemed to feel especially uncomfortable about describing any mistakes or shortcomings, particularly to foreigners. During group discussions, farmers mentioned only those points that they thought researchers would like to hear. Farmers' responses during the Participative Rural Appraisal (PRA) exercise were more assertive than in the household survey and individual discussions. At least some weaknesses of the Project's activities were mentioned in the household survey and individual discussions. Farmers even gave different answers to foreigners and Chinese researchers. This identifies a major potential difficulty for foreigners working with farming communities in China. I tried to overcome this problem by triangulating (use of information from different sources to draw conclusions) the information collected via different methods and sources.

Now I feel that perhaps farmers' perceptions about the weaknesses of the Project might have been documented more easily if my study would have been tailored with a M.Sc. study by a Chinese student. We both could benefit from each other's strengths. I could help in survey techniques and participatory approaches. Similarly, the Chinese student could help the evaluation work by successfully collecting the farmers' perceptions of project weaknesses. This is just an example based on my experience and there could be other areas where we could benefit from each other's strengths and improve the quality of the output of the evaluation study.

Dr Madhu Subedi
The University of Wolverhampton, UK
E-mail: M.Subedi@wlv.ac.uk

International ESSC Conference on 'Soil and Water Conservation under Changing Land Use', Lleida (Catalonia, Spain), 12 – 15 September 2006

The Conference was organized by Professor Ildefonso Pla Sentís and his team from the Department of Environment and Soil Sciences, University of Lleida, Spain, with support from Universitat de Lleida, Fundació Universitat de Lleida, Generalitat de Catalunya (Departament d'Educació i Universitats), the ESSC, Sociedad Española de la Ciencia del Suelo (SECS) and the World Association of Soil and Water Conservation (WASWC).

As stated by the Conference organizers, land degradation is affecting directly or indirectly all the vital processes on the earth's surface, which mainly depend on the conservation of soil and water in adequate places, amounts and qualities. Economic and social problems, associated with changes in population, markets and prices of the products and technology may induce drastic and sudden changes in land use and management, which may increase the hazard of land degradation and environmental effects. Global climate changes may increase negative influences of these changes. This is especially true in the South European countries, where the recent abrupt and generalized changes in land use and management, involving in some cases abandonment of previous agricultural lands, and in others intensification of agricultural land use or utilization of land for other purposes, are leading to different environmental impacts, with immediate or future negative effects. Those effects include problems of loss of biodiversity, decreased supply and quality of available water, and increases in soil erosion, landslides and flooding. All of these changes have marked social and economic effects, both in the short- and long-term. In arid and semi-arid regions, these effects may lead to irreversible desertification.

Over 100 participants from 19 countries attended the Conference. Representatives were from Austria, Belgium, Brazil, Canada, the Czech Republic, France, Germany, Italy, Japan, Puerto Rico, Romania, Russia, Slovenia, South Africa, Spain, Thailand, Turkey, the UK and USA.

The Conference consisted of four days of invited and volunteered oral and poster presentations and a field trip, with the objective to analyse and discuss the most recent cases and results of studies and research in relation to soil and water conservation problems associated with changes in land use and management. The presentations were, apart from the opening and closing session, organized in three sessions, with the following topics:

- Land use changes affecting soil and water conservation (Day 1).
- Processes of soil and water degradation under changing land use and management (Day 2).
- Soil and water conservation practices under changing land use and management (Day 4).

Each half-day session was introduced by outstanding invited keynote speakers:

- Julian Dumanski (Consultant Sustainable Land Management, Ottawa, Canada): 'Changing course: soil conservation in a changing world'.
- Ildefonso Pla Sentís (University of Lleida, Spain): 'Hydrological effects of land use under Mediterranean climate conditions'.
- Samir A. El-Swaify (University of Hawaii at Manoa, USA): 'Predicting the erosion consequences and conservation needs of changing land use: a case study for transition from plantation agriculture to diversified cropping'.
- Eric Roose (Institut de Recherche pour le Développement, France): 'Evolution of anti-erosive strategies with changing land use'.
- Winfried E.H. Blum (European Confederation of Soil Science Societies ECSSS - University of Natural Resources and Applied Life Science BOKU, Austria): 'Urban and peri-urban environments: emerging frontiers in soil and water conservation'.

In all, 26 oral presentations were given and concurrently 43 posters were exhibited during the Conference. The extended abstracts of the keynote lectures and the oral and poster presentations are published in the Conference proceedings, edited by J.A. Martínez-Casasnovas, I. Pla Sentís, M. Concepción Ramos Martín and J. Carles Balasch Solanes.

A one-day field trip was organized to the Priorat region. The trip was a nice combination of cultural and gastronomical aspects, with more scientific issues. The excursion was perfectly timed for a group of soil and water conservationists, as 14 September, the day of the excursion, appeared to be the wettest in several months. Cultural stops included the village of Siurana, the last Muslim stronghold in Catalonia (1153), the ruins of the ancient Charterhouse of Cartusian monks (1203) and the village of Torroja del Priorat with its typical cobble stone streets. We could experience the Catalan gastronomy at 'the New York of the Priorat' La Vilella Baixa, and at two wine cellars. Scientific information was given about the different management systems, including traditional and terracing systems, of vineyards. Various field equipment including rainfall simulators, Gerlach troughs and soil-water content sensors (Trime-TDR) were demonstrated.

At the closing session, it was concluded that the level of degradation of the natural resources, and particularly soils and water as related to changing land use in rural areas, is resulting in serious environmental impacts in many areas of the world. Considering the importance of the multi-functionality of soil and water resources and the impact of these on human health and welfare, particularly in densely populated areas, the Conference requested that decision makers, land managers and administrators:

(1) Ensure application of sound environmental management technologies in soil and water conservation, so as to ensure the environmental health for present and future generations,

(2) Recognize the importance of high quality soils for agriculture and the environment, and to protect this valuable resource from urbanization, and

(3) Apply more effectively soil information and scientific knowledge to protect and safeguard the ecological and life support capacity of soils. The Conference finally recommended that all governments and institutions pay particular attention to soil and water and their functions, stressing the importance of these natural resources

for maintaining and safeguarding the environmental equilibria for human health and well-being.

Finally, I would like to thank and congratulate (and I am sure on behalf of all participants) the organizers for this excellent Conference.

Wim Cornelis
Department of Soil Management and Soil Care
International Centre for Eremology
Ghent University
Belgium

Archives in Agronomy and Soil Science Volume 52, Number 2, pages 125-241, April 2006, ISSN 0365-0340. Co-edited by Professor Raimo Kõlli (Estonian Agricultural University, Tartu) and Dr Elke Schulz (Editor-in-Chief of 'Archives in Agronomy and Soil Science'). Published by Taylor and Francis, Abingdon, Oxfordshire, UK.

Special Issue

Soil Conservation in Nordic Countries – Contributions of the Conference of the European Society of Soil Conservation (ESSC) in May 2005 in Tartu, Estonia.

Editors note: The Foreword of this special issue of 'Archives in Agronomy and Soil Science' is reproduced in full below:

R. Kõlli. *Contributions to the Conference of the European Society for Soil Conservation (ESSC) in Tartu*, Estonia: pages 125-126.

Foreword

Soils form at the interface of the Earth's superficial geological layers and the living biosphere. Thus, by its nature, soil is a vast life-bearing natural body. With its global distribution, soil influences ecosystem productivity and functioning, environmental status and consequently the quality of life. This is the main reason for research into scientific principles of soil protection and developing a European Thematic Strategy for Soil Protection.

While our attention is drawn to many global aspects of soil formation, functioning and degradation processes, one must not overlook the specific characteristics of local pedo-ecological and related socio-economic conditions. We must use accumulated knowledge of the properties of specific soils to intelligently adjust local soil management strategies.

Northern areas have very specific pedo-ecological, social and economic conditions. Generally, Nordic areas have relatively thin soils, a short biologically-active (frost-free) period, extensive areas of waterlogged soils and intensive soil leaching. Furthermore, some soil degradation processes, such as desertification and salinization, are virtually absent. In Northern areas, many agricultural lands were reclaimed from forest by hard work. The difficulties in developing highly productive agriculture in Nordic rural areas means these arable soils deserve special attention, partly due to the specific socio-economic aspects of their development.

The focus of the ESSC Conference held in Tartu on 25 – 26 May 2005 was 'Soil conservation issues in Nordic countries'. Specific themes included: 1) case studies of soil conservation practice and multifunctional land use in Nordic rural areas; 2) soil policy and 3) pedo-ecological, theoretical and socio-economic aspects of soil conservation.

The Conference identified many common aspects, but also substantial differences, between the north and south of Europe in terms of soil protection policy and practice:

- The common feature of most soil degradation processes is the weakening or loss in the functioning capacity of the soil cover. In such cases soil conservation may be achieved by a combination of ecologically-sound land use; soil remediation (i.e. liming, drainage), nutrient inputs and conservation agriculture technology. However, these must be adapted to local conditions. For effective protection of soil cover, the prevention, mitigation, control and regulation of locally occurring soil degradation processes (i.e. acidification, erosion and podzolization) are essential.
- The best Nordic agricultural soils must be protected from reforestation and soil sealing by construction. These are especially important on areas where arable lands form under 1/4 –1/3 of total territory. Organic soils are extensive and widely distributed in Nordic areas and represent huge natural pools of sequestrated organic carbon. These organic soils must be protected from excessive mineralization, by adopting suitable land utilization and plant cover.
- The philosophy of soil conservation should be much more refined and scientifically validated on the basis of local ecological conditions and soil properties. Soil conservation strategies that are ecologically sound and profitable for local socio-economic conditions depend greatly on the correct associations between soil properties and suitable plant cover.
- The success of soil conservation in Europe depends on the efficacy of regionally adapted soil policies. Some of the case studies devoted to soil conservation practice in Nordic rural areas are presented in the 12 papers in this special issue.

Professor Raimo Kõlli
(Estonian Agricultural University, Tartu)

Review of the 'Soil Conservation in Nordic Countries' Special Issue

From 25 – 26 May 2005, the ESSC had its conference in Tartu, Estonia with about 60 participants. The conference, entitled 'Soil Conservation in Nordic Countries' consisted of 17 oral presentations and a poster session. The report of this meeting was published in the ESSC Newsletter 2/2005 (pp. 26-28). A Special Issue of the Archives of Agronomy and Soil Science (Archiv für Pflanzenbau und Bodenkunde), published in April 2006 (Vol. 52/2), contained 11 papers prepared on the basis of the presentations given in the Conference. The Preface was written by Professor Raimo Kõlli from the Estonian University of Life Sciences. These papers had altogether 44 authors from eight countries, the corresponding authors coming from Estonia, Lithuania, Norway, Sweden and The Netherlands.

As the EU has adopted the 'Thematic Strategy for Soil Protection' in 2002 and the 'Soil Protection Framework Directive' was proposed by the Commission in 2006, the contents of this Special Issue are highly topical. The Nordic countries occupy a large area of Europe and they therefore deserve full attention by the scientific community, as well as by those who formulate soil policy in Europe. The Special Issue covers a wide spectrum of the various constraints which result in loss of soil functions or weaken the soil cover functioning capacity in the Nordic countries. More specifically, the papers deal with land use changes, nutrient balances and leaching, soil compaction and erosion as well as the response of soil organic matter (SOM) to cultivation practices and the impact of different micro-organisms to soil pollution by heavy metals.

In their paper, Kõlli *et al*. set the stage by presenting the major soil cover constraints in the Nordic countries, consisting of low temperature, waterlogging, soil compaction, leaching and acidification, erosion caused by rain, snow-melt and wind, and, possibly as a surprise to many colleagues of more southern areas, occasional drought hazards, to mention the most wide-spread ones. The extent of these constraints is estimated in Estonia. Astover *et al*. described the dramatic decrease of the area of field crops in Estonia after the re-establishment of Independence and even a more drastic decrease of nitrogen (N), phosphorus (P) and potassium (K) applications. According to the national nutrient balances, these nutrients have been mined by crops from Estonian agricultural soils. Their results show that in 2001 – 2003 the input of N and K for forage crops has been about 50 kg/ha less, and that of P about 10 kg/ha less, than the uptake by the crop. Gradual depletion of nutrients is evident, even though for the time being, there may still be residual P and K from the plentiful applications of the past. Marcinkonis quantifies the leaching of nutrients from dominant soils of Lithuania on the basis of lysimeter experiments, indicating substantial depletion of N, calcium and magnesium. This depletion can, at least to some extent, be corrected from nutrient reserves of local origin by heavy applications of calcareous organic-rich lake mud (sapropel), as shown by the long-term field experiments of Baksiene *et al*.

Impact of management practices on the concentration and biochemical properties of SOM in a 14-year field experiment in Estonia were reported in two papers (Szajdak *et al*. and Teesalu *et al*.). The concentrations of carbon (C), N and Indole Acetic Acid and activities of urease and nitrate reductase seem to respond quite substantially to the applications of mineral and organic fertilizers in this Stagnic Albeluvisol originally low in SOM. These results show that the process of SOM depletion to detrimentally low levels is not limited to southern areas but can take place also in cool and humid climate, but the SOM level can be successfully maintained by applications of organic fertilizers, particularly farmyard manure. On the other hand, results by Grønlund *et al*. from a pipe-drained peat soil show that annual losses of CO_2 were as high as 5.5 tonnes C/ha. Even though C loss of even this extent does not have a negative effect on the functioning of a peat soil itself, it is a notable source of CO_2 into the atmosphere. In this paper, emissions of N_2O and CH_4 were also reported.

High concentrations of lead, copper and zinc were shown to have adverse impacts on microbial communities in experiments reported by Vaisvalavicius *et al*. They showed that actinomycetes, oligonitrophic and mineral N assimilating bacteria were highly susceptible to high concentrations of these metals, while fungi and spore-

forming bacteria seemed to have more effective defensive mechanisms, resulting in their higher survival in environments polluted with these heavy metals.

Soil compaction is a major form of physical degradation in agricultural soils of the Nordic countries as a response to field traffic under very common waterlogged conditions. Subsoil compaction is difficult to correct with any management practice once it has taken place. In their review, Keller and Arvidsson present means to prevent subsoil compaction, based on wheeling experiments in Sweden. This paper also contains a comprehensive list of references about the topic. However, Reintam *et al*. report positive results of an experiment where growing annual lupines has ameliorated the compaction of a sandy loam Stagnic Luvisol. Erosion is another major process of soil degradation. Even though the Conference Report says that several presentations were given about erosion in the Nordic countries, the paper included in the Special Issue is a review from The Netherlands. It a slight disappointment not to be able to read anything about erosion in the Nordic countries, but Spaan *et al*. tell an interesting story about Dutch policies and practices on erosion control in the past and at present.

This Special Issue is a good compilation of research currently carried out in the field of soil conservation in a broad sense. It is seldom that this number of papers dealing with soil degradation and conservation in the Nordic counties are published in a single issue of an international journal. Usually these papers are spread out in different journals and are, therefore, more difficult to locate. I believe that this Special Issue is a good source of information to everybody interested in agricultural soils of the Nordic countries in general, and in soil conservation issues in particular.

Markku Yli-Halla
Professor of Environmental Soil Science,
The University of Helsinki, Finland.

Soil Erosion and Carbon Dynamics. Advances in Soil Science

By Eric J. Roose, Rattan Lal, Christian Feller, Bernard Barthès and Bobby A. Stewart (Editors) (2006). Published by CRC Press, Boca Raton, Florida, USA, 352 pp. (ISBN 1-56670-688-2)

This very timely book integrates two prevailing and crucial paradigms in soil science: the issues of soil erosion and the dynamics of soil carbon, particularly carbon sequestration. The book consists of 21 chapters, based on the international colloquium 'Land Uses, Erosion and Carbon Sequestration' held in Montpellier, France, from 23 – 28 September 2003.

The book is divided into four sections:

1. 'Basic Concepts' (four chapters)
2. 'Erosion at the plot scale' (10 chapters).
3. 'Carbon transfer in rivers' (six chapters).
4. 'Conclusions' (one Chapter).

The book is impressive and scholarly. The five editors have integrated the work of 81 contributing scientists. The chapters cover a variety of spatial scales (global, catchment and plot scales). Furthermore, reports are from diverse bioclimatic regimes (arid, semi-arid, Mediterranean, humid tropical and subtropical) in the continents of Africa, Asia and South America. The book collates much of the 'state-of-the-art', with 75 tables and 112 Figures (but only one photo!). The comprehensive references, quoting 867 publications, offers valuable pathways to more advanced reading.

A few caveats must be added. Given the large amount of information to digest, chapter abstracts would have been useful. However, each chapter does present a helpful conclusions section. Surprisingly, many parts of the world receive little or no attention. Europe only has one paper (Kristof Van Oost *et al*.), with North America and Australasia receiving no coverage. Furthermore, there is no specific coverage of the vital carbon stores in the high latitude peat-lands of northern Canada and Russia. However, one must recognize that information on soil erosion in these environments is sparse.

On balance, this is a valuable and informative book. As such it will be a vital reference tool in the armoury of soil scientists fighting the daunting global problems of soil erosion and climatic change.

Mike Fullen
The University of Wolverhampton, U.K.

SCAPE (Soil Conservation and Protection in Europe). The Way Ahead (2006). European Union (EUR 22187 EN), 139 pp. (ISBN: 90-75312-06-7)

A.C. Imeson, O. Arnalds, L. Montanaralla, A. Arnoldussen, S. van Asselen, L. Dorren, M. Curfs and Diego de la Rosa (2006)

'Soil Conservation and Protection for Europe (SCAPE). The Way Ahead' is a collective book synthesizing the achievements of the SCAPE European Union Cost Action Project. In the last three years SCAPE has organized five workshops with 131 participants and nearly 100 papers presented and discussed around the criteria for soil conservation in Europe.

The book is written by 21 contributors and co-ordinated by eight main authors. The 139 pages are organized into six chapters and three appendixes containing the conclusions of the Project and 10 case studies in nine European countries.

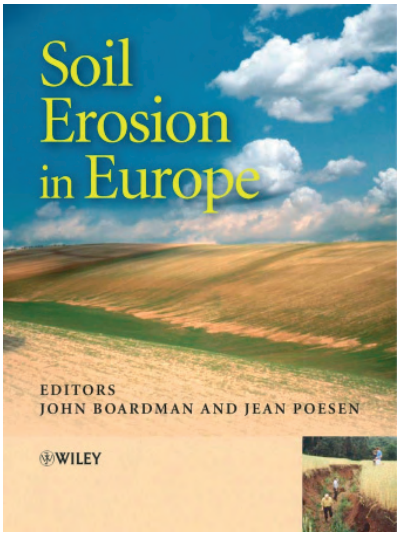
Far away from the objectives of a manual the book inform *"about the critical importance of soil for your future health and wellbeing"*. The introductory chapters (1 – 3) are a good compilation of what is known in the soil conservation topic, written in a concise and clarifying way that can be understood also by non-scientists, also with the help of text frames that give definitions and complementary information. Topics like the significance of soils, their role in human health, the implications of climatic change and soil data, inventories and monitoring are developed.

Chapter four develops 10 examples of good practice in soil conservation, focusing on the water-land use interaction in semi-arid lands, forest fires, the impact of soil conservation on rivers and the implications of agriculture on desertification in areas of Spain and Portugal. The soil threats assessment and forest protection are emphasized for areas of Slovenia, Italy and Austria. Soil sealing by construction and soil erosion prevention practices and policies are described, using examples in Germany, The Netherlands, Norway and Iceland. The last two final chapters are a compilation of actions and suggestions of what can be done to improve soil conservation policies, but showing the complexity of a web of local, regional, national and European interests.

The book as a whole is an interesting compilation of work on soil conservation, in with the authors show most of the variables involved in the process from a European perspective, illustrating with useful case studies. Is a good starting point for the consideration, development and implementation of new ideas that can help in the task of diagnosing the threats to the sustainable use of soil and introduce better protection policies.

For more details on the SCAPE Project see: www.scape.org

Adolfo Calvo-Cases
University of Valencia, Spain.



Book Announcements

Soil Erosion in Europe

John Boardman and Jean Poesen (Editors)

ISBN: 0-470-85910-5
Hardcover
878 pages
Published by John Wiley and Sons Ltd., Chichester, UK.
Published October 2006
£160.00 / €240.00

Editor's note: We are pleased to announce that the Book 'Soil Erosion in Europe' was published in October 2006. This represents an important initiative, edited and led by John Boardman (Oxford, UK) and Jean Poesen (Leuven, Belgium). Many members of the ESSC have contributed to this work. Dr Matt Römkens (Oxford, Mississippi, USA) has kindly agreed to review the Book and this review will be presented in Newsletter 2007/2.

LIST OF CONTENTS

SECTION 2

Introduction

2.1. Past soil erosion in Europe: A. Lang, H.R. Bork.

Soil Erosion Processes

2.2. Soil erosion processes across Europe: major processes, causes and consequences: J. Poesen, J. Boardman.

2.3. Soil Surface crusting and structure slumping in Europe: L-M. Bresson, Y. Le Bissonnais, P. Andrieux.

2.4. Sheet and rill erosion: O. Cerdan, J. Poesen, G. Govers, N. Saby, Y. Le Bissonnais, A. Gobin, A. Vacca, J. Quinton, K. Auerswald, A. Klik, F.J.P.M. Kwaad, M.J. Roxo.

2.5. Gully erosion in Europe: J. Poesen, T. Vanwalleghem, J. de Vente, A. Knapen, G. Verstraeten, J.A. Martínez-Casasnovas.

2.6. Piping hazard on collapsible and dispersive soils in Europe: H. Faulkner.

2.7. Wind erosion: R. Funk, H.I. Reuter.

2.8. Shallow landsliding: O. Maquaire, J-P. Malet.

2.9. Tillage erosion: K. Van Oost, G. Govers.

2.10. Soil losses due to root and tuber harvesting: G. Ruysschaert, J. Poesen, G. Verstraeten, G. Govers.

2.11. Erosion of non-cultivated land: R. Evans.

2.12. Land levelling: L. Borselli, D. Torri, L. Øygarden, S. De Alba, J.A. Martínez-Casasnovas, P. Bazzoffi, G. Jakab.

Risk Assessment and Prediction

2.13. Pan-European soil erosion assessment and maps: A. Gobin, G. Govers, M.J. Kirkby.

2.14. Assessing the Modified Fournier Index and the Precipitation Concentration Index for some European Countries: D. Gabriels.

2.15. Pan-European soil erodibility assessment : Y. Le Bissonnais, J. Daroussin, O. Cerdan, J. Léonard.

2.16. Modelling soil erosion in Europe: V. Jetten, D. Favis-Mortlock.

2.17. Existing soil erosion datasets: J. Baade, S. Rekolainen.

2.18. Impacts of environmental changes on soil erosion across Europe: M.J. Kirkby.

Off-site impacts and responses

2.19. Muddy floods: J. Boardman, G. Verstraeten, C. Bielders.

2.20. Reservoir and pond sedimentation in Europe: G. Verstraeten, P. Bazzoffi, A. Lajczak, M. Radoane, F. Rey, J. Poesen, J. De Vente.

2.21. Off-site impacts of erosion: eutrophication as an example: S. Rekolainen, P. Ekholm, L. Heathwaite, J. Lehtoranta, R. Uusitalo.

2.22. Economic frame for soil conservation policies: J. Shuler, H. Kächele, K. Müller, K. Helming, P. Zander.

2.23. Government and agency response to soil erosion risk in Europe: M.A. Fullen, A. Arnalds, P. Bazzoffi, C.A. Booth, V. Castillo, A. Kertész, P. Martin, C. Ritsema, A. Solé Benet, V. Souchère, L. Vandekerckhove, G. Verstraeten.

2.24. Agri-environmental measures and soil erosion in Europe: P. Bazzoffi, A. Gobin.

Index

We are including the citation details of papers and books produced by ESSC members. This is providing 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. 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, 30 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.

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In Memorium: Professor Dr Mircea Motoc (1916 – 2006)

We regret to report that Mircea Motoc recently passed away. Professor Motoc had a long and fruitful career in research and teaching and was the founder of modern soil conservation in Romania.

Mircea Motoc graduated in 1941 and gained a Ph.D. in 1963 at the University of Agronomy in Bucharest. After participation in the Second World War, he worked from 1944 to 1973 as a research scientist within the Romanian Institute for Agronomic Research (ICAR) and at several specialized Institutes resulted from later division of this one. From 1973 until retirement he was Professor at the University of Agronomy. He remained active after retirement. He was Deputy Director of a research institute (1966 – 1969) and Secretary of the Romanian Academy of Agricultural and Forestry Sciences (1969 – 1973), as well as Dean of the Land Melioration College (1976 – 1977). Mircea Motoc was a Member of the Romanian Academy of Sciences (corresponding member elected 1963, full member elected 1990) and of the Romanian Academy of Agricultural and Forestry Sciences (elected 1969). He was an active member of several non-governmental Romanian and international societies, in 1960 – 1964 being Secretary of Commission 6 of the International Soil Science Society.

Research on soil conservation started in Romania in the late 1930s, but underwent important developments when Mircea Motoc started his work. He took part and then was leader of several field studies on soil survey in areas affected by erosion. He continued observations on several existing runoff plots and extended this basic research to multiple plots in most areas with erosion problems of the country. In 1953 he was one the main contributors to the establishment of the Research Centre on Soil Erosion, located in Perieni-Barlad in one of the areas with severe erosion. This remains the main experimental institution in this field of science in Romania. Runoff plots, specific land consolidation plots, terraces, landslide and gully management experimental plots, as well as field experiments with various land use and soil management techniques, were initiated and are still present today.

Mircea Motoc developed, since the early 1970s, a model of soil erosion, nowadays called ROMSEM, a local variant of the USLE model. It was necessary to adjust the original US model, as some of the needed input data existing in Romania were different from the USA. The basic empirical factor estimating soil loss is dependent on the relief (slope length and gradient) factor, and the rain erosivity coefficient is based on the amount of rain multiplied by the 15-minutes rain intensity. Based on the research if Professor Motoc and his team, a map of erosivity, and later a pedotransfer function enabling estimation in soil survey studies of soil erodibility, were prepared. Based on this model, an analysis on extension of soil erosion and on the national amount of soil losses (an estimated average of 126 million tonnes per year) was published. Much work was done by Mircea Motoc and his team in extension, especially in co-operation with agencies for design and implementation of soil erosion control projects.

Besides many papers published in Romanian and international journals, Mircea Motoc published a handbook on soil erosion, in three successive editions (1959, 1963, 1975), one of these was published in Russian. Mircea Motoc had during his whole life an important role in Romania as a leader in his field of science, as a teacher and as an extremely catalyst in the development of a new generation of scientists.

Andre Canarache
Research Institute of Soil Science,
Agrochemistry and Environment Protection,
Bucharest, Romania

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. We launched the Bulletin Board on 18 October 2006. 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 details are reported in ESSC Newsletter 2005/1. These details are also 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. Please send updated information to Zuzana Tekelová at:

E-mail: tekelova@vupu.sk

Forthcoming Dates for Your Diary

First Announcements

28 to 30 May 2007, Lleida (Spain)

The 15th N Workshop is organized by RUENA (Red Española para el Uso Eficiente del Nitrógeno) and the Department of Environment and Soil Sciences of the University of Lleida (DMACS-UdL):

http://www.nitrogen15workshop.udl.es/nitrogen/html/introduction.html

Contents of the Workshop

- Opening session: Nitrogen research evolution through N workshops. Keynote lecturer: Dr J.J. Neeteson. Plant Research International B.V., Wageningen, The Netherlands.

- Theme 1: Approaches to N management in order to improve N-use efficiency. Keynote speaker: D.G. Lemaire, INRA, Lusignan, France.
  - 1.1. Diagnostic tools for N fertilization recommendation and fertilization strategies.
  - 1.2. Management practices to reduce environmental impact of nitrogen fertilization.
  - 1.3. N and water management in the Mediterranean climate.
- Theme 2: N flows in agricultural systems, grassland and forest systems. Keynote speaker: D. Claudio O. Stockle. Washington State University, USA.
  - 2.1. N flows. The role of micro-organisms.
  - 2.2. N flows. Gaseous nitrogen losses.
  - 2.3. N flows. Components of the N balance.
  - 2.4. Nitrogen flows. Adaptation to different scales: field, farm, region.
- Theme 3: External constraints to N fertilisation. Keynote speaker: Not yet confirmed.
  - 3.1. Nitrogen fertilization economy.
  - 3.2. Contribution of 'border disciplines' to better N management.
  - 3.3. Nitrogen fertilization and product quality.

A part from these plenary sessions, there will also be poster sessions, a field trip (three parallel technical field trips) and a workshop (10 parallel workshops in one session).

Deadlines

For abstract submission:		21 December 2006
Acceptance of abstract:		1 February 2007
Ends of registration at reduced rates:		16 February 2007
Student rate (ID required):	€250	
Full rate:	€450	
End of registration at full rate:		12 April 2007
Student rate (ID required):	€300	
Full rate:	€500	

Submission of extended abstract (three-page paper): 20 April 2007.

Registration fee

This includes: welcome cocktail, coffee breaks and lunch (but not evening meals), conference book of abstracts, proceedings on CD, access to all sessions, conference dinner and field tour.

If you have any questions, please address them to the following e-mail addresses:

Contents of the workshop:
15th-N-Workshop@nitrogen15workshop.udl.es

Any other organizational matters:
congresnitrogen@700.udl.es

We encourage you to visit our web site:
http://www.nitrogen15workshop.udl.es/

International Conference on Forest Soil Science: Results, Issues, Prospects 4 – 11 September 2007 Syktyvkar, Russia

You are cordially invited to attend International Conference on 'Forest Soil Science: Results, Issues, Prospects', which will be held in Syktyvkar (Komi Republic, Russia) between 4 – 11 September 2007.

Main Conference Topics

1. Genesis and classification of forest soils.
2. Soil cover structure in forest ecosystems. Spatial heterogeneity of forest soils.
3. Natural and anthropogenic change (evolution) of forest soils.
4. Soil biota and its role in forest biogeocenosis dynamics.
5. Soil organic matter - basis for stable functioning of forest ecosystems.
6. Forest exploitation and ecological problems.

Official Language

The working languages of the Conference are Russian and English.

Scientific Committee

Chair – Professor A.S. Vladychensky (Russia);
Co-chairman – Academician of RAS G.V. Dobrovolsky (Russia);
Co-chairman – Professor I.V. Zaboeva (Russia).

Members: Prof. S.A. Shoba (Russia), Prof. L.O. Karpachevsky (Russia), Prof. Eleonora Bonifacio (Italy), Doctor of Biology G.A. Simonov (Russia), Prof. N. Dinev N. (Bulgaria), Prof. I. Kisich (Croatia), Doctor of Agricultural Science V.D. Tonkonogov (Russia), Doctor of Agricultural Science, Prof. N.G. Fedorets (Russia), Doctor of Biology Science V.F. Vedrova V.F. (Russia), Doctor of Biology L.S. Shugaley (Russia), Doctor of Biology B.R. Striganova (Russia), Prof. S.N. Chukov (Russia), Prof. V.O. Targulian (Russia).

Organising Committee

A.I. Taskaev – Chairman (Institute of Biology, Komi Scientific Center, Ural Division of RAS, Syktyvkar); E.M. Lapteva – Co-chairman (Institute of Biology, Komi Scientific Center, Ural Division of RAS, Syktyvkar); A.P. Borovinskikh – Co-chairman (Ministry of Natural Resources and Environmental Control of the Komi Republic (Syktyvkar)); D.A. Kaverin – Secretary (Institute of Biology, Komi Scientific Center, Ural Division of RAS, Syktyvkar).

Members: V.D. Obukhov (Forest Agency of the Komi Republic (Syktyvkar)), V.A. Beznosikov, A.A. Kolesnikova, S.V. Zagirova, K.S. Bobkova, E.D. Lodygin, A.N. Panukov, A.V. Pastukhov, A.A. Dymov (Institute of Biology, Komi Scientific Center, Ural Division of RAS, Syktyvkar).

Organisers

- Russian Academy of Sciences, Institute of Biology, Komi Scientific Center, Ural Division of RAS (Syktyvkar) V.V. Dokuchaev Association of Soil Scientists (Moscow).

- Moscow State University, Faculty of Soil Science (Moscow).
- Ministry of Natural Resources and Environmental Control of the Komi Republic (Syktyvkar).
- Forest Agency of the Komi Republic (Syktyvkar).

Publications

A book of abstracts will be published. The proceedings will be issued after the Conference. The Organizing Committee is responsible for the selection of materials.

Important Dates

• First Announcement	December 2006
• Registration Deadline	15 February 15 2007
• Second Announcement	February 2007
• Abstract Submission Deadline	15 April 2007
• Conference Programme Available	June 2007
• Publication of Abstracts	June 2007
• Arrival in Syktyvkar	4 September 2007
• Conference	5 – 7 September 2007
• Scientific Field Trips	8 – 10 September 2007
• Departure of Participants from Syktyvkar	11 September 2007

Registration fee: $100

The fee covers (payment deadline: **June 1, 2007**) the book of abstracts and some conference materials, coffee breaks, a tour of the town and museum visits.

Scientific Field Trips

- Option 1: Liali Forest Research Station (8 September 2007);
- Option 2: Ust-Kulom District: field trip – examination of podzolic soils of a chronosequence of clear cuts (8 – 10 September 2007).

Contact Information

Institute of Biology, Komi Scientific Center, Ural Division of RAS, 167982, 28 Kommunisticheskaya st., Syktyvkar, Russia
Tel.: 00 7 (8212)24-51-15; Fax: 00 7 (8212)24-01-63
e-mail: soilforest@ib.komisc.ru

REGISTRATION FORM

First name: . . . . . .

Family name: . . . . . .

Middle name: . . . . . .

Academic status: . . . . . .

Academic degree(s): . . . . . .

Affiliation: . . . . . .

Post: . . . . . .

. . . . . .

Address: . . . . . .

. . . . . .

. . . . . .

Telephone: . . . . . Fax: . . . . . .

E-mail: . . . . . .

Title of the paper/poster: . . . . . .

. . . . . .

. . . . . .

Topic: . . . . . .

Presentation:	☐ poster,	☐ oral
Need hotel reservation:	☐ Yes,	☐ No
Excursion:	☐ Yes	☐ No
Excursion option:	☐ 1	☐ 2

Registration form is submitted either by e-mail: soilforest@ib.komisc.ru or by regular post: see CONTACT INFORMATION.

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 space 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, 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).

Key dates

15 March 2007: Due date for papers *(no more than 2 pages)*.
20 May 2007: Deadline for communication to the authors of the Scientific Committee's decision. Accepted papers may include minor corrections, to be made by the authors.
31 May 2007: Due date for submission of final version of papers.
30 June 2007: Deadline for 'Early Bird Registration' with reduction in registration fees.

Conference venue

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

Contact Details

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

Erosion and Torrent Control as a Factor in Sustainable River Basin Management Conference, 25 – 28 September 2007, Belgrade, Serbia

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 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.

Important deadlines

abstract and registration submission	16 March 2007
abstract acceptance	15 April 2007
full paper submission	30 June 2007

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.

International Conference to celebrate 60 Years of the Institute of Soil Science 'Nikola Poushkarov' entitled 'Soil Science – Base for Sustainable Agriculture and Environmental Protection', 13 – 17 May 2007, Sofia, Bulgaria

Under the Patronage of the
Ministry of Agriculture and Forestry (MAF)
Ministry of Environment and Waters (MEW)

Thematic scope

- Soil genesis, soil classification, cartography, geographic information systems (GIS).
- Soil properties and processes.
- Land evaluation and soil fertility management.
- Soil care and environmental protection.

Organizing Committee

Chairman: Dr Svetla Bachvarova: President NCAS
Vice-Chairmen: Professor Dr N. Kolev (director of N. Poushkarov ISS), Professor Dr I. Kolchakov (President of the Bulgarian Soil Science Society), D. Vangelov (Director of Soil Resources Agency, MAF)
Secretaries: Associate Professor Dr B. Georgiev, Professor Dr E. Filcheva, Dr M. Kercheva
Members: Assoc. Prof. Dr N. Dinev, Prof. Dr D. Slavov, Assoc. Prof. Dr D. Stoicheva, Assoc. Prof. R. Donkova, Assoc. Prof. Dr A. Lazarov, Assoc. Prof. Dr I. Dimitrov, Dr V. Koleva (N. Poushkarov ISS), Assoc. Prof. Dr L. Malinova (University of Forestry), Assoc. Prof. Dr N. Artinova (Agrarian University, Plovdiv), V. Stefanova (Soil Resources Agency, MAF), Assoc. Prof. Dr N. Ivanova (MAF), T. Dimitrova (MEW)
Technical Secretaries: T. Popova, L. Nikolova
Scientific excursion: Professor Dr M. Teoharov, Assoc. Professor Dr R. Ilieva (N. Poushkarov ISS), S. Nedyalkov (Soil Resources Agency, MAF).

Scientific Committee

Atanassov I., Bulgaria
Bakalivanov D., Bulgaria
Bech J., Spain
Behar A., Bulgaria
Bielek P., Slovakia
Blum W., Austria
Boneva K., Bulgaria
Chuldjian H., Bulgaria
Dilkova R., Bulgaria
Dumitru M., Romania
Gabriels D., Belgium
Gencheva Sv., Bulgaria
Hadjiparaskevas C., Cyprus
Haigh M., UK
Kapur S., Turkey
Kibblewhite M., UK
Kozak, Czech Republic
Krastanov Sl.., Bulgaria
Mermut A., Canada
Micheli E., Hungary
Montanarella L., Italy
Nikolov N., Bulgaria
Ninov N., Bulgaria
Oenema O., The Netherlands
Pagliai M . Italy
Radcliffe D., USA
Russeva Sv., Bulgaria
Shein E., Russia
Smeian N., Belarus
Sokolowska Z., Poland
Stoinev K., Bulgaria
Stoyanov D., Bulgaria
Targulian V, Russia
Tsadilas, Greece
Varrallyay G., Hungary
Van Ranst E., Belgium
Vladiychenskiy A., Russia
Zdruli P., Italy

Preliminary Programme

13 May

17:^{00} – 19:^{00} Registration
19:^{00} onwards Welcome party

14 May

08:^{30} – 10:^{00} Registration:
10:^{00} – 11:^{00} Opening and celebration of 60 years of 'N.Poushakrov' ISS
11:^{00} – 12:^{30} Plenary session
14:^{00} – 17:^{00} Oral presentations
10:^{00} – 18:^{00} Poster sessions

15 May

09:^{00} – 12:^{30} Oral presentations
14:^{00} – 17:^{00} Oral presentations
09:^{00} – 18:^{00} Poster sessions
17:^{00} – 18:^{00} Closing session

16 – 17 May

Scientific excursion

General Information

Venue: N. Poushkarov Institute of Soil Science, Sofia 7, Shosse Bankya str. (bus No 42 from the Metro station 'Slivnitza').

Language: Bulgarian, Russian and English.

Technical support: Multimedia and overhead projection will be available.

Presentation: Oral presentations are limited to 10 minutes. The maximum area available for each poster will be 80 cm (height) and 90 cm (width).

Registration fee: €150. The registration fee covers Conference materials, Welcome party and Coffee-breaks. Conference tour: €50.

The registration fee should be paid **before 15 February 2007,** preferably by bank transfer to: Bulbank Ltd., Kaloyan Branch, 3 Kaloyan str., 1000 Sofia, Bulgaria.

BIC: BFTBBGSF IBAN: BG 45 BFTB 7630 3400 001964.

Accomodation: Hotel accommodation (US$50 – 60/night).

Passport and visas: Participants are advised to consult the nearest consular office of Bulgaria for visa requirements. A letter of invitation will be sent upon request.

Address of the Organizing Committee

Conference '07 (Lidia Nikolova, Tonya Popova) N.Poushkarov Institute of Soil Science, 7 Shosse Bankya str., Sofia 1080, Bulgaria.
Fax: 00 359 2 8248937
Tel.: 00 359 2 8248976 L. Nikolova
00 359 2 8240253 Dr B. Georgiev

Deadline for Notification of accepted papers and final programme: 15 March 2007.

Contact Details

View: http://www.iss-poushkarov.bg or e-mail: soil@mail.bg

CONFERENCE '07
13 – 17 May 2007

Name . . . . . ☐ Mr. ☐ Mrs. ☐ Dr ☐ Prof.

Surname . . . . . .

Organization: . . . . . .

Address: . . . . . .

. . . . . .

Tel.: . . . . . Fax: . . . . . .

E-mail: . . . . . .

I wish to:

☐ Attend the Conference . . . . . .

☐ Submit a paper . . . . . .

☐ Attend the excursion . . . . . .

Preferred presentation format: ☐ oral ☐ poster

Author(s) and Title

. . . . . .

. . . . . .

. . . . . .

Accompanying person(s)

. . . . . .

Date: . . . . . Signature: . . . . . .

Pedometrics 2007

www.Pedometrics.org

Biannual Conference of Commission 1.5 Pedometrics, Division 1, of the International Union of Soil Sciences (IUSS)

Dear Colleagues,

We are pleased to announce **Pedometrics 2007** (the Biannual Conference of Commission 1.5 Pedometrics, Division 1, of the International Union of Soil Sciences (IUSS)) to be held 27 – 30 August 2007 in Tübingen, Germany.

Pedometrics 2007

The Conference covers all major topics of pedometrical research and their applications. It comprises geostatistics, the research fields of the related working group on digital soil mapping, proximal soil sensing, as well as soil fractals, wavelets and spatial accuracy.

We welcome all soil scientists, soil surveyors, soil geographers, environmental scientists and engineers, GIS specialists, geostatisticians, statisticians and mathematicians to join the Conference and exchange their knowledge.

A Pre-Conference Workshop on Uncertainty Propagation Analysis will be held by Gerard B.M. Heuvelink and James D. Brown. A field trip introducing the soilscapes and the famous vineyards of Baden-Wurttemberg follows the Conference.

Information

For more information on Conference venue, important dates, registration information, the workshop and the tentative agenda, visit the Conference web site:

http://www.pedometrics.de.

We would appreciate if you could please forward this message to colleagues and staff who may be interested in attending.

We are look forward to seeing you in Tübingen!

Best wishes

Thorsten Behrens, Volker Hennings and Thomas Scholten.

Contact:

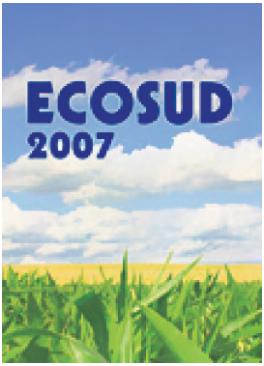
Thorsten Behrens
University of Tübingen
Institute of Geography
Ruemelinstrasse 19-23
72070 Tuebingen
Germany.
Tel: 00 49 7071 29 78943
Fax: 00 49 7071 29 5391
E-mail: thorsten.behrens@uni-tuebingen.de

Organization and Support

Eberhard Karls Universität Tübingen

BGR Federal Institute for Geosciences and Natural Resources

www.Pedometrics.org



Sixth International Conference on Ecosystems and Sustainable Development

Coimbra, Portugal, 5 – 7 September 2007.

ECOSUD 2007 is the Sixth International Conference in the well-established series on 'Ecosystems and Sustainable Development'. The meetings provide a unique forum for the presentation and discussion of recent work on different aspects of ecosystems and sustainable development, including physical sciences and modelling. The Conference aims to help create a new science in line with Prigogine's statement that *"at all levels we observe events associated with the emergence of novelties and narrative elements, which we may associate with the creative power of nature"*. ECOSUD is not only a forestage to present novel research related to ecological problems from all over the world; it also gives opportunities for new emergent ideas in science arising from the cross fertilization of different disciplines, including mathematical models and eco-informatics, evolutionary thermodynamics and biodiversity, structures in ecosystems modelling and landscapes, to mention but a few.

The aim of the Conference is to encourage and facilitate interdisciplinary communication between scientists, engineers and professionals working in ecological systems and sustainable development. Emphasis will be given to those areas that will most benefit from the application of scientific methods for sustainable development, including the conservation of natural systems around the world. The Conference objectives have evolved over the years, seeking to integrate thermodynamics, ecology and economics into 'ecodynamics'. This successful series first started in Peniscola, Spain (1997); and continued in Lemnos, Greece (1999); Alicante, Spain (2001); Siena, Italy (2003) and Cadiz, Spain (2005).

Conference Topics: Thermodynamics and ecology; Sustainability indicators; Mathematical and system modelling; Ecosystems modelling; Biodiversity; Sustainability development studies; Conservation and management of ecological areas; Socio-Economic factors; Energy conservation and generation; Environmental and ecological policies; Environmental management; Environmental risk; Natural resources management; Recovery of damaged areas; Biological aspects; Complexity; Remote sensing; Landscapes and forestation issues; Soil and agricultural issues; Water resources; Sustainable waste management; Air pollution and its effects on ecosystems. For further information, please visit our website:

http://www.wessex.ac.uk/conferences/2007/eco07/index.html
or e-mail the Conference Secretariat at: ecosud@wessex.ac.uk

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: 21 and 22 April 2008

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

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 regards 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,
Zhonguancun Dong Lu 95, Hadian,
Beijing 100080
P.R. China
E-mail: stokes@liama.ia.ac.cn
Tel: 00 86 10 82614528
Fax: 00 8610 62647458.

5th INTERNATIONAL CONGRESS of the European Society for Soil Conservation

Palermo - June, 25-30 2007

5th International Congress of the ESSC

EUROPEAN SOCIETY FOR SOIL CONSERVATION

Changing Soils in a Changing World: the Soils of Tomorrow

25 – 30 June 2007

Palermo, Italy

BACKGROUND

Soil is the thin layer of the Earth that fulfils fundamental functions in terms of life in general and particularly in terms of the needs and well being of human societies. Increasing demands are being imposed upon the soil by different human activities. These activities are growing and competing with each other, without taking account of the diversity of soils, their function and their potential. Consequently, soils are degraded in different ways, depending on their vulnerability.

The second half of the 20th Century was particularly disastrous: erosion, urbanization, landslides and flooding, local and diffuse contamination, salinization and entisolization were the main problems linked to an unbalanced ratio of Man/Soil. Throughout Europe, the headlong rush into agricultural, industrial and urban development wrought destruction upon soils and their functions. Little has been done in reality to mitigate soil degradation and to improve the condition of soil already heavily degraded. This is largely due to ignorance, in all spheres of society, of what the soil really is and why it is necessary to conserve its functions. Such ignorance has its roots in the absence of soil awareness.

OBJECTIVES

The main objectives of the 5th ESSC International Congress is to promote exchange and discussion about the problems that affect the soils due to the pressure of Man on Soils and Landscape, that are becoming progressively more evident and to stimulate soil awareness in civil society. The Congress is open to soil scientists, educators and policymakers. It will consist of invited lectures, scientific sessions with oral and poster presentations and scientific and cultural excursions.

DEADLINES

31 January 2007	Deadline for abstract submission
28 February 2007	Deadline for registration at reduced fee
31 March 2007	Notice of acceptance of abstracts
30 April 2007	Last announcement and final programme

For registration and abstract submission, please refer to our website:
www.esscpalermocongress.it

The Organizing Committee will take into account the possibility of publishing the Congress proceedings in a volume printed by CATENA VERLAG. All participants are kindly requested to submit their papers/presentation, in compliance with the instructions indicated on the web site.

TOPICS AND INVITED SPEAKERS

Lectio Magistralis	Ahmet MERMUT	Saskatchewan	Canada
Topic 1: Soils and Society	Victor TARGULIAN	Moscow	Russia
Topic 2: Soil Erosion	Eric ROOSE	Montpellier	France
Topic 3: Soil Organic Matter	Nicola SENESI	Bari	Italy
Topic 4: Soil Degradation and Desertification	Marcello PAGLIAI	Florence	Italy
Topic 5: Soil Pollution and Contamination	Steve McGRATH	Rothamsted	United Kingdom
Topic 6: Soil Conservation and Soil Quality	Lars BERGSTRÖM	Uppsala	Sweden
Topic 7: Policies for Environmental Conservation in a Global Society	Winfried BLUM	Vienna	Austria
Topic 8: New Approaches and Technologies for Soil Assessment	Paolo SEQUI	Rome	Italy

ORGANIZING COMMITTEE

Carmelo Dazzi, Vito Ferro, Vincenzo Bagarello, Salvatore Monteleone, Ignazio Poma, Edoardo Costantini, Lucio Gristina, Giuseppe Lo Papa.
Università di Palermo
Viale delle Scienze
90128 Palermo, Italy
Tel: 00 39 091 6650247
fax: 00 39 091 6650229

PRELIMINARY PROGRAMME

25 June, Monday

Morning:			Arrival of participants and registration
16:^{00}	–	18:^{00}	ESSC Council Meeting
18:^{00}	–	19:^{00}	Opening ceremony
19:^{00}	–	20:^{00}	Lectio Magistralis
20:^{00}			Welcome party

26 June, Tuesday (Topic 1 and 2)

8:^{30}	–	13:^{00}	Registration
9:^{00}	–	09:^{45}	Opening lecture
9:^{45}	–	10:^{00}	Coffee-break
10:^{00}	–	12:^{30}	Thematic session (Topic 1)
12:^{30}	–	14:^{30}	Lunch
14:^{30}	–	15:^{15}	Opening lecture
15:^{15}	–	17:^{45}	Thematic session (Topic 2)
17:^{45}	–	18:^{00}	Coffee-break
18:^{00}	–	19:^{00}	Poster sessions (Topics 1 and 2)

27 June, Wednesday (Topics 3 and 4)

9:^{00}	–	9:^{45}	Opening lecture
9:^{45}	–	10:^{00}	Coffee-break
10:^{00}	–	12:^{30}	Thematic session (Topic 3)
12:^{30}	–	14:^{30}	Lunch
14:^{30}	–	15:^{15}	Opening lecture
15:^{15}	–	17:^{45}	Thematic session (Topic 4)
17:^{45}	–	18:^{00}	Coffee-break
18:^{00}	–	19:^{00}	Poster sessions (Topics 3 and 4)
19:^{00}	–	20:^{00}	ESSC General Assembly

28 June, Thursday (Topics 5 and 6)

9:00	–	9:45	Opening lecture
9:45	–	10:00	Coffee-break
10:00	–	12:30	Thematic session (Topic 5)
12:30	–	14:30	Lunch
14:30	–	15:15	Opening lecture
15:15	–	17:45	Thematic session (Topic 6)
17:45	–	18:00	Coffee-break
18:00	–	19:00	Poster sessions (Topic 5 & 6)
21:00			Congress dinner

29 June, Friday (Topic 7 and 8)

9:00	–	9:45	Opening lecture (invited speaker)
9:45	–	10:00	Coffee-break
10:00	–	12:30	Thematic session (Topic 7)
12:30	–	14:30	Lunch
14:30	–	15:15	Opening lecture (invited speaker)
15:15	–	17:45	Thematic session (Topic 8)
17:45	–	18:00	Coffee-break
18:00	–	19:00	Poster sessions (Topics 7 and 8)
19:00	–	19:30	Conclusions of the Congress

30 June, Saturday

7:30	–	19:45	One-day scientific and cultural excursion (2 choices)
	1st choice		Scientific and cultural excursion to Sparacia Farm and Temple valley of Agrigento.
	2nd choice		Scientific and cultural excursion to Belice area and Selinunte archaeological area.

SCIENTIFIC AND CULTURAL EXCURSION

1st option

SPARACIA FARM AND TEMPLE VALLEY IN AGRIGENTO

Cultural and pedo-agronomical aspects of the Mediterranean environment. Vertic soils of the Mediterranean environment. Experimental installations for measuring water erosion at microplot, plot and basin scales in a hilly Sicilian area.

The trip proceeds to Agrigento with a visit to the TEMPLES VALLEY, where there is one of the best-preserved Greek archaeological zones in the world. An English-speaking guide will show the Concordia, Venus, Zeus and Hercules temples. At the end of the visit, return to Palermo.

2nd option

Belice Area and Selinunte Archaeological Park

Cultural and pedo-agronomical aspects of the Mediterranean environment. Problems of land management due poor land management decisions. Environmental problems due to soil consumption. The trip proceeds with a visit to the important ARCHAEOLOGICAL PARK OF SELINUNTE. It consists of various temples, set in a semi-deserted zone, since the old town is uninhabited nowadays. There are the remains of the old city, destroyed by an earthquake in antiquity. At the end of the visit, return to Palermo.

Scientific Committee

Jaques Berthelin	Nancy	France
Pavol Bielek	Bratislava	Slovakia
Andrea Buondonno	Bari	Italy
Wolfgang Burghardt	Essen	Germany
Nicola Fohrer	Kiel	Germany
Michael Fullen	Wolverhampton	United Kingdom
Donald Gabriels	Ghent	Belgium
Ádám Kertész	Budapest	Hungary
Luca Montanarella	Ispra	Italy
Paolo Nannipieri	Firenze (Florence)	Italy
Mark Nearing	Tucson	USA
Stephen Nortcliff	Reading	United Kingdom
Ildefonso Plá Sentis	Lleida	Spain
Antonio Rodriguez	La Laguna (Canary Islands)	Spain
Juan Sanchez	Valencia	Spain
Thomas Scholten	Tuebingen	Germany
Diane Stott	Lafayette	USA
Des Walling	Exeter	United Kingdom

WEBSITE: www.esscpalermocongress.it

SCIENTIFIC SECRETARIAT
Professor Carmelo Dazzi
Dipartimento di Agronomia Ambientale e Territoriale (DAAT)
Facoltà di Agraria – Università di Palermo,
Viale delle Scienze
90128 Palermo, Italy.
E-mail: dazzi@unipa.it
mail@esscpalermocongress.it
Tel: 00 39 091 6650247
Fax: 00 39 091 6650229

ORGANIZING SECRETARIAT
BIBA Congressi
Via Emilia
38-90144 Palermo, Italy.
E-mail: congressi@bibatour.it
Tel: 00 39 091 527416
Fax: 00 39 091 527416.

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.
(iv) 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 will publish four Newsletter issues per year. The deadlines for 2007 onwards are:**

10 January 1 April 1 July 1 October.

Some Closing Thoughts:

"Out of mud the lovely lotus blossoms, Out of trials something higher vies." **(Raymond Ng)**
"Be humble, for you are made of earth Be noble for you are made of stars." **(Serbian Proverb)**
"Once the skin has gone, where can the hair grow?" **(Ancient Chinese Proverb)**
"A nation that destroys its soil destroys itself" **(Franklin D. Roosevelt)**
"Don't treat soil like dirt" **(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

MEMBERSHIP FEES

I wish to (please mark appropriate box):

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

Membership rates:

Standard Rates:

- One year € 25.00
- Three years € 70.00

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

- One year € 10.00
- Three years € 25.00

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

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

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

NAME: .....

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.....

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

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

wim.cornelis@UGent.be