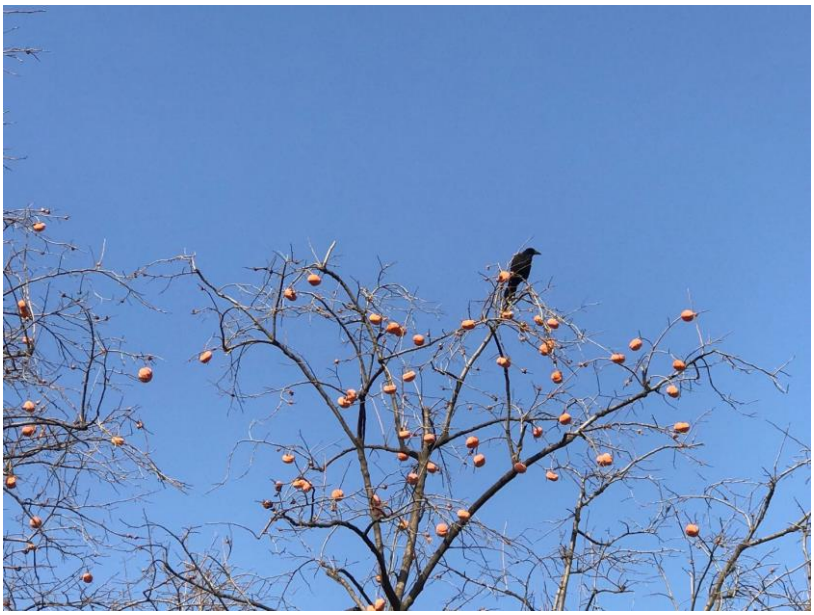
WORLD ASSOCIATION OF SOIL AND WATER CONSERVATION

HOT NEWS

Issue 10, 2018



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Contents

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International Training Workshop on Integrated Sediment Management in River Basins held in Beijing

The International Training Workshop on Integrated Sediment Management in River Basins organized by the International Research and Training Center on Erosion and Sedimentation (IRTCES) was held in Beijing, China from November 5-10, 2018, about 50 participants attended the training workshop, including lecturers, representatives from UNESCO, International Centre for Water Resources and Global Change (ICWRGC), International Association of Hydropower (IHA), China Institute of Water Resources and Hydropower Research (IWHR) and IRTCES, and trainees from Indonesia, Iran, Kenya, Malaysia, Mongolia, Morocco, Sudan, Uganda and China.

The opening ceremony

The opening ceremony of the training workshop was held in the morning on November 6. Chaired by Deputy Director of the IRTCES Prof. Liu Guangquan, opening remarks were made by Prof. Manfred Spreafico, Chairperson of

UNESCO-ISI Advisory Group; Dr. Anil Mishra and Dr. Hans Thulstrup, Programme Specialists of UNESCO. Prof. Ning Duihu, Deputy Director of IRTCES, delivered a welcome speech, and followed by a brief introduction and instruction of the workshop made by Prof. Liu Cheng, Deputy Division Chief of IRTCES and a member of UNESCO-ISI Advisory Group.

The training workshop included lectures, seminars, and a one-day field visit. Topics included river basin management, soil and water conservation technology, ecology and restoration in integrated river basin management, reservoir sedimentation and sediment management technology. Participants also contributed to a seminar involving guided discussion of national case study presentations prepared by participants.

The lecture presentations included:

- 2030 Development Agenda and International Hydrological Program (IHP) (Dr. Anil Mishra, member of ISI Advisory Group; Programme Specialist, UNESCO/Division of Water Sciences)
- Reservoir sedimentation and sediment management (Prof. Manfred Spreafico, Chairperson of ISI Advisory Group; Emeritus Professor of the University of Berne, Switzerland);

Dr. Anil Mishra

Prof. Manfred Spreafico

- The impact of Global Change on the sediment loads of the world's rivers (Prof. Des. Walling, member of ISI Advisory Group; Past President of WASER; Emeritus Professor of the University of Exeter, U.K.);
- Overview of Soil and Water Conservation in the World (Prof. Li Rui, WASWAC President; Professor of the Institute of Soil and Water Conservation, Chinese Academy of Sciences and Ministry of Water Resources, China);
- Soil and Water Conservation in China (Prof. Li Rui);

Prof. Des. Walling

Prof. Li Rui

- Integrated Sediment Management –with the Yellow River as an example (Prof. Wang Zhao-Yin, member of ISI Expert Group; WASER President; Professor of Tsinghua University, China);
- Vegetation-Erosion Dynamics and Application in China (Prof. Wang Zhao-Yin);
- Sediment-related ecological problems and their control (Prof. Xu Mengzhen, (Ms.), Professor of Tsinghua University, China);
- Sediment monitoring in Germany: implications for managing sediment-related ecological problems in developing countries (Dr. Thomas Hoffmann, member of ISI Expert Group; Head of Sediment Laboratory, German Federal Institute of Hydrology, Koblenz, Germany);

Prof. Wang Zhaoyin

Prof. Xu Mengzhen

Dr. Thomas Hoffmann

Coordinated by Prof. Des. Walling, a seminar of country presentations and discussions was held and 8 presentations were made by participants from Sudan, Morocco, Kenya, Uganda, Iran, Indonesia, Mongolia and China.

In the late afternoon of November 8, the closing ceremony was organized chaired by Prof. Liu Cheng. Prof. Manfred Spreafico, Prof. Des. Walling and Dr. Anil Mishra made brief closing remarks. The participants were awarded certificates by Prof. Manfred Spreafico, Prof. Des. Walling, Dr. Anil Mishra, Prof. Ning Duihu, Prof. Liu Guangquan, and Prof. Liu Cheng.

On November 9, a study tour visiting Daxing Experimental Base of the IWHR was arranged. Participants visited laboratories of sediment research, hydraulics and hydraulic mechanism and had discussions with engineers of IWHR.

Certificates awarding

Study Tour

The International Training Workshop on Integrated Sediment Management in River Basins is organized by the International Research and Training Center on Erosion and Sedimentation (IRTCES); sponsored by UNESCO, Ministry of Water Resources, P.R. China, UNESCO Office Beijing and Jakarta, and International Sediment Initiative (ISI)-IHP-UNESCO; and co-sponsored by China Institute of Water Resources and Hydropower Research (IWHR), International Centre for Water Resources and Global Change (ICWRGC), World Association for Sedimentation and Erosion Research (WASER), and World Association of Soil and Water Conservation (WASWAC). This represents a major ISI activity for 2018. It fulfils the objectives of the new strategy of ISI, which in turn contributes towards the 8th phase of IHP (2014-2021) which has the title “Water security: responses to local, regional and global challenges” by addressing the wide-ranging social, economic and environmental impacts of erosion, sediment transport and sedimentation processes with due consideration of gender perspectives.

A group photo

Global Hydro-enviornment and Progress of IWHR

Prof. Peter Goodwin, the president of IAHR

IWHR (China Institute of Water Resources and Hydropower Research) has become one of the first batch institutes that paid systemic attention to water resource management and research over the world, Peter Goodwin, the president of IAHR, expressed his viewpoint during the IWHR academic week in October 2018.

1. Your view about the global status quo and trend for sustainable hydro-environment development.

Prof. Peter Goodwin: The priorities and challenges for the Hydro-environment and Hydraulics Engineering global community are captured succinctly within the Sustainability Development Goals developed by the United Nations. Specifically, we live in a world where clean water is a scarce resource and we are experiencing greater variability in the frequency and intensity that this water arrives in our watersheds. Water is essential for human health, food production, economic development and sustaining our natural environment. This was emphasized in an elegant way by President Xi Jinping at the Opening Ceremony of the B20 Summit

in Hangzhou (3 September 2016):

"....green mountains and clear water are as good as mountains of gold and silver. To protect the environment is to protect productivity and to improve the environment is to boost productivity."

The speech then expands on the commitment by China to a green, low carbon and recyclable economy. These priorities are being expressed in a similar manner in many other countries.

These goals face several severe challenges:

- Increasing population on landscapes that are already close to the capacity of current land utilization. Increasing populations require more water - either through tapping natural rivers or using existing water resources more efficiently.
- Changing land use practices (for example: urbanization, intensive agriculture, road and rail embankments and levees that separate rivers and coasts from floodplains and wetlands) that alter the patterns of rainfall runoff or drainage.
- Introduction of invasive (non-native) plant and animal species that out-compete the native flora and fauna. This can change entire ecosystems so that key food sources for important species are diminished.
- Transboundary issues need to be addressed in a way that optimizes the outcomes of economic development and ecological recovery that cross geo-political boundaries. Watershed and ecosystems invariably cross local, provincial and sometimes national governments. It is therefore important that hydro-environment experts can structure the science and engineering alternatives in a way that can inform decision-makers and be understood by the public.
- Climate Change. Many regions of the world are experiencing unprecedented conditions that have not been experienced since records have been taken. Until the last few years, we made predictions of the magnitude of floods, droughts, highest expected storm surge or wave height based on a careful analysis of the

historic record. These predictions were used to design infrastructure to protect society from catastrophic flooding or prolonged droughts. However, the increased variability being experienced in many regions means that we cannot rely solely on the past to predict future conditions. Examples of the severity of the effects of climate change is evidenced by the more that 500 million people living on low-lying river deltas that are increasingly vulnerable to sealevel rise and greater frequency and intensity of storms (Giosan, L. et al., 2014. Nature. 516. 31-33).

These pressures on the environment are not simple and interact with several sectors of the economy and the quality of life. Demands of energy generation, food production, fisheries management, transportation, manufacturing must be balanced against concerns for endangered species, recreation and the natural environment.

The biggest challenge facing the Hydro-environment experts is maintaining and improving the quality of life for society within a healthy earth system. This requires large teams of experts representing many disciplines of engineers, scientists, economists and social scientists to explore and articulate alternative futures based on different management strategies we adopt today in a way to inform the decisions made by policy-makers and leaders.

2. How do you look at the Chinese achievement in this field by now?

Prof. Peter Goodwin: China has some of the largest and most dynamic rivers in the world, for example, the Yellow river transports more sediment to the ocean than any other river. China also has one of the largest populations that depend on these rivers and are impacted in flood and drought events. Therefore, China has a long and illustrious history in the realm of hydraulic engineering, understanding how rivers behave and developing techniques for managing extreme events to minimize the loss of life or property. As an example, one of the marvels in the world for hydraulic engineering is the Dujiangyan Irrigation System that received the 2013

IAHR World Heritage Award. The brilliance of this project, constructed around 256 BC, is not only that the diversion passes through a cut made in the mountain, but that it can divert the waters of the MinJiang River to the fertile Chengdu plains without requiring significant maintenance of sediments at the site of the diversion. The deposition of sediments at the inlet of large water diversions is a major problem elsewhere in the world. This ancient solution has puzzled and delighted the international engineering community for decades.

Chinese expertise continued to flourish in the intervening centuries, often before other countries were even considering water supply and wastewater management. More recently, over the past four decades, China initiated one of the most advanced and aggressive water infrastructure development programs in the world. Starting with the Three Gorges Project, this program has advanced the known technical limits of dam construction, dealing with unprecedented water pressures for hydropower generation and innovative ways of ship passage - such as the new ship lifts using new cable technologies at the Three Gorges Dam. These types of projects inevitably have environmental consequences, and China is developing deep expertise in anticipating, addressing and mitigating impacts on water quality and iconic species such as the Chinese Sturgeon.

3. How do you look at the IWHR achievement in this field over its 60 years of development?

Prof. Peter Goodwin: IWHR has an illustrious history of major contributions to the field of Hydraulic Engineering and Hydro-environment research. The research institute has grown into a comprehensive organization capable of looking at all aspects of water resource development and implications to the river and regional communities. This covers traditional topics such as water resources planning, geotechnical engineering, structures, seismic engineering, and irrigation and drainage and real-time flood prediction. More recently, IWHR has adopted a more comprehensive approach to watershed management that includes resilience to

flood and droughts, sustainable hydropower development, water resources in rural areas and environmental response to large water resources infrastructure. IWHR is one of the first institutes in the world to adopt such a holistic view to managing and researching water resources.

4. What is your expectation or wishes for IWHR in the future?

Prof. Peter Goodwin: Firstly, congratulations to President Kuang Shangfu and the leadership team of IWHR on your 60th Anniversary. Over the past few decades you have grown IWHR into an internationally recognized research institution. This has been achieved through exceptional internal management - it is obvious to visitors that this Institute believes in strong teamwork, exemplary research and application of this research to solve some of the most perplexing problems in implementing large infrastructure projects or mitigating adverse consequences to the environment and local communities. This has also been achieved by fostering international and national collaborations, exchanges of scientific information and sharing experiences on engineering solutions on large river systems.

On behalf of the global IAHR community, we look forward to continued and deepening collaborations between IAHR and IWHR. We expect IWHR will continue the pioneering efforts in event forecasting, simulating flood flows and river behavior with sophisticated computer models, designing large structures that protect or benefit people and implementing innovations for enhancing water quality and ecological recovery. We hope that IWHR will continue to grow its significant existing expertise to understand the interaction between water resource development projects with the ecosystem services provided by rivers, watersheds and coastal water systems. We look forward to what IWHR will achieve in the next 60 years.

Opportunities for soil sustainablility in Europe

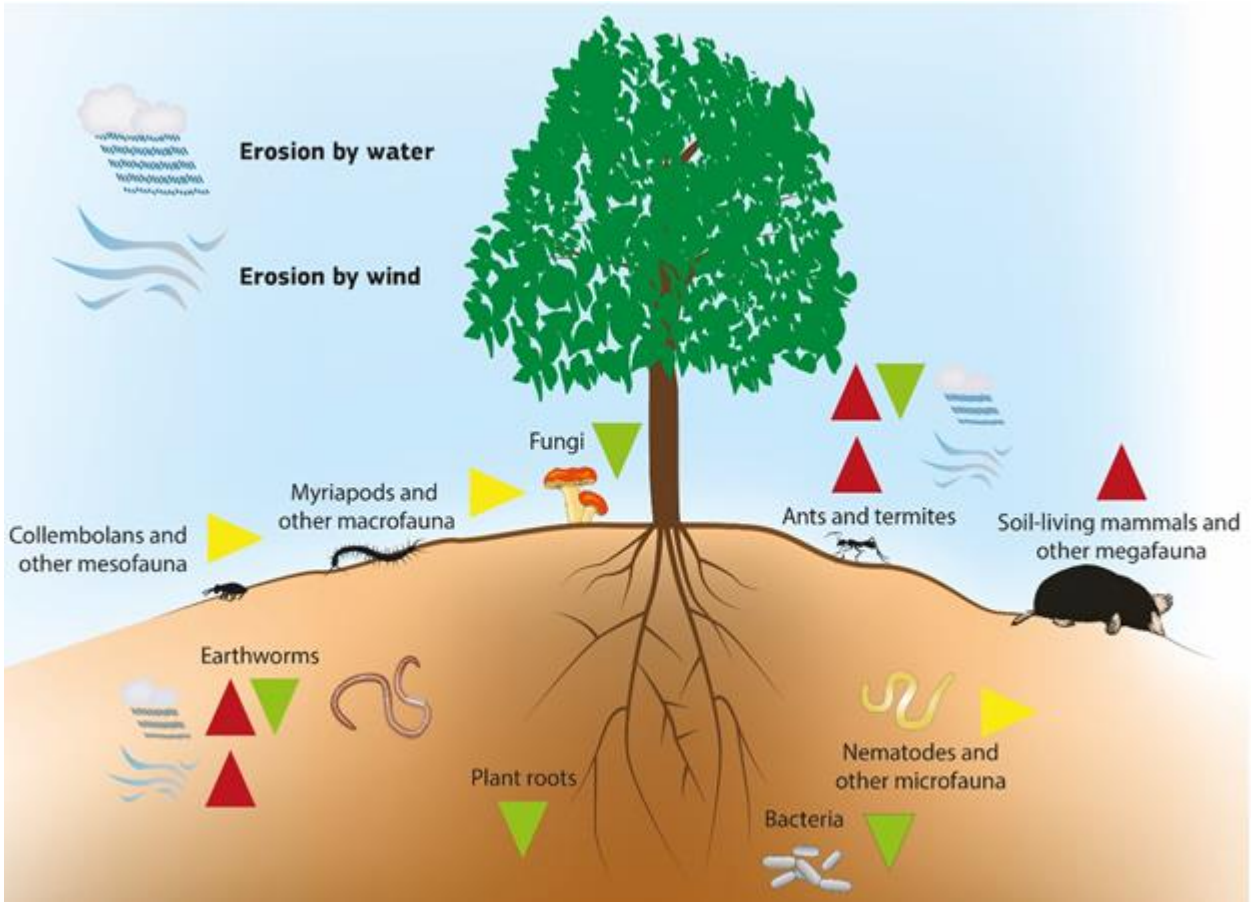
Soils provide numerous essential services in terrestrial ecosystems, ranging from the support of plant growth in agriculture and forestry to moderation of flood risks, water purification, large-scale carbon storage, and support of biodiversity. However, despite soils' essential roles, they are threatened by sealing, compaction, reductions in quality and organic-carbon content, and erosion, and insufficiently included in sustainability planning in the EU. A multidisciplinary group of European experts has examined the implications of recent scientific research for integrated policy solutions towards ensuring the sustainability of Europe's soils, and identified many opportunities for policy-makers to safeguard this valuable resource for the benefit of the EU's citizens.

Download this book here:

https://easac.eu/publications/details/opportunities-for-soil-sustainability-in-europe/

Biodiversity factor in soil erosion

New estimates of soil loss can be generated by including biological factors in soil erosion models. At the same time, the effects of soil loss on belowground diversity require further investigation. Available data and technologies make both processes possible. We think that it is time to commit to fostering the fundamental, although complex, relationship between soil biodiversity and erosion.



In this context, we identified three possible areas of research that, in our opinion, require advances in the coming years:

1.Comprehension and quantification of the interactions between soil biodiversity and erosion;

2.Development and integration of a “biodiversity factor” into the models used to assess soil erosion;

3.Assessment of the ecological impact of soil erosion on soil - living communities. According to the current (limited) knowledge, earthworms can play a key role in reducing soil erosion, mainly due to their burrowing activity that increase soil porosity. Based available pan-European (11 countries) maps of earthworm richness and abundance, we developed an "Earthworm factor" (Et-factor) to be integrated into soil erodibility (K-factor) calculation. Due to uncertainty on the potential impact of earthworm communities on soil loss, two Et-factors were generated, one including richness and abundance (EtAR-factor), the other only abundance data (EtA-factor). Both factors were then included into K-factor to obtain revised soil erosibility values (KEt-factor).

Four maps available for download:

1.Et_Factor_Abundance_Richness (EtAR-factor): Earthworm factors calculated considering both richness and abundance data

2.K_factor_Et_Abundance_Richness: New soil erodibility including EtAR-factor

3.Et_Factor_Abundance (EtA-factor): Earthworm factors calculated considering only abundance data

4.K_factor_Et_Abundance: New soil erodibility including EtA-factor

Spatial Coverage: Pan-European, 11 countries: Belgium, Denmark, France, Germany, Hungary, Ireland, Luxembourg, Slovenia, Spain (partly), the Netherlands and the United Kingdom

Resolution: 500m

Time Reference: 2009

Format: Raster (tiff)

Projection: GRS_1980_IUGG_1980_Lambert_Azimuthal_Equal_Area

Input data: Soil erodibility (Panagos et al., 2014) and earthworm richness and abundance (Rutgers, Orgiazzi et al., 2016) in Europe

More Information:

https://esdac.jrc.ec.europa.eu/themes/soil-biodiversity-and-soil-erosion

1. Earth observation data scientist

Terrabotics
Terrain Intelligence

Are you a talented data scientist eager to use apply your hard-earned academic skills in a flexible, fulfilling, yet real salary earning environment?

If so, we're offering you an exciting opportunity to join our world-class team of start-up professionals, engineers and scientists to build a new way in which the world's natural resources are mapped, measured, monitored and managed.

As an integral part of the Product Development and R&D team, you will support the ideation, design, development and testing of new automated satellite image and geospatial data driven product-solutions. This role will entail designing and testing new analytical, numerical and statistical solutions enabled by vast amounts of satellite remote sensing data from sources such as optical imagery, multi-/hyper-spectral data, SAR radar imagery and even atmospheric measurements.

This exciting role is for you if you have:

- Very strong experience with scripting languages such as Python, R, Julia, bash or equivalent is a minimum requirement. More advanced professional software development experience will be a significant advantage
- A post-graduate degree in numerical Geosciences, Physics, Mathematics, Computer Science or Engineering
- Knowledge of key principles of satellite remote sensing, image processing, spectral analysis, photogrammetry and image understanding
- A keen interest in Earth and/or Atmospheric sciences and their real-world applications

Ready to become part of a world-class team? Then send your CV and covering letter to jobs@terrabotics.co.uk or visit our jobs page for further details on the role - http://www.terrabotics.co.uk/jobs/

2. Environment and Society (Open Professor Rank)

Young and research-intensive, Nanyang Technological University (NTU Singapore) is ranked 12th globally. It is also placed 1st among the world's best young universities.

The Asian School of the Environment (ASE) at NTU Singapore (NTU; www.ntu.edu.sg) seeks applications for the position of (i) Assistant or Associate Professor and (ii) Professor for the study of Human-Environment Interactions as part of an initiative to expand the Society and Earth Systems specialization.

We seek candidates with demonstrable potential to help establish ASE as a leader in studies in human-environment interactions in Southeast Asia. Research fields of interest include but are not limited to: Environmental and Ecological Economics; Environmental Decision-Making, Governance and Policy; Societal Drivers and Impacts from Climate Change, Risk and Resilience, Dynamics of Anthropogenic Change; Coupled human-environmental systems.

For these positions, we seek scientists with outstanding track records of academic research and teaching. The successful candidate will help establish the School as a leader in studies in human-environment interactions in the region.

Research

It is expected that you will lead innovative research on human-environment interactions in Southeast Asia using either or both data-driven quantitative

methods and analysis techniques and/or qualitative methods and analysis techniques. The ASE offers excellent opportunities for cross-disciplinary research.

Education

You will teach undergraduate and graduate classes in the ASE and ensure high-quality education in the subject matter. You will also supervise PhD students in your discipline. You will help to build the Society and Earth Systems undergraduate and graduate curricula, which include significant interdisciplinary overseas fieldwork components.

Service

As a faculty member at the ASE, you play an important role in society through your research and teaching, and through your active participation in educational committees and working groups of ASE and NTU Singapore.

Profile

Successful candidates should have:

- A PhD in geography/ environmental economics/ environmental sciences/ anthropology/ political science or related discipline
- Proven experience in high quality interdisciplinary academic research
- A strong scientific track record with international publications
- Demonstrable excellence in teaching
- For applicants for associate or full professorships, demonstrated leadership in managing research teams, attracting research funding and project management with multiple partners
- Strong interpersonal skills with the ability to function in international teams

Application

All applications including a letter of interest of no more than 3 pages, including the names and email addresses of three referees and a CV should be submitted and addressed to ASE-EnvSoc@ntu.edu.sg before 31 January 2019. Selected applicants will be invited to submit a full application package, including research and teaching statements.

Land and Soil Management Award

About the Award

Sustainable land and soil management is central to improve our food systems, maintain a healthy environment and ensure European rural development. Indeed, soils, through their structure and the great variety of species they host, perform numerous functions including food production, nutrient and water storage, filtering, buffering as well as breaking down and conserving organic matter. They also play a central role in the protection of water and in the natural exchange of gases with the atmosphere. Moreover, soils are biological habitats, gene pools, elements of landscapes and of cultural heritage as well as providers of raw materials. They are therefore crucial for agriculture and for all human beings as well as for nature itself, and are the foundation of our health and our wealth. Soils are as such part of Europe's greatest treasures, thus, it is important to promote and reward practices which contribute to their protection.

The prize rewards land use and soil management practices mitigating soil threats i.e. soil degradation, erosion, reduction of organic matter content, diffuse contamination, and compaction as well as the reduction of soil biodiversity, salinization, sealing, flooding and landslides. In doing so, the award sheds light on outstanding achievements, encouraging new concepts of land and soil protection and their implementation in land management, as well as enhancing awareness about the importance of land and soil functions.

Who can apply?

Farmers, landowners, land managers, groups of farmers, on their own or in collaboration with research institutes, universities and/or private companies.

Why to apply?

To recognize the great value of the farmer's work, by promoting the winning project as a good practice at the EU level. Also, to enhance the visibility of such ways of farming at the local, national as well as European scale and to encourage the farmers to further develop their work in a sustainable path.

5.000 € is awarded to the winning project every year. The Jury can also award a Diploma of Recognition.

How to apply?

The call for application is open, you need to send the filled out application form latest on December 31, 2018.

The award is bestowed to the winner every year during the Forum for the Future of Agriculture (FFA) Gala Dinner.

Please note: the application should preferably be filled out in English. If the application chooses another language a well-structured English summary of the project should be enclosed.

To download the application form click here.

Partners

This award has been launched in 2008 by the European Landowners' Organization (ELO), under the auspices of the European Commission (DG Environment and the Joint Research Centre) and in association with the University of Natural Resources and Life Sciences (BOKU) of Vienna, Syngenta International AG, as well as the Centre for Soil and Environmental Sciences of the Ljubljana University. Since then, the award jury has selected outstanding achievements throughout the European Union in the field of sustainable soil and land management.

Award Coordinator Contact:

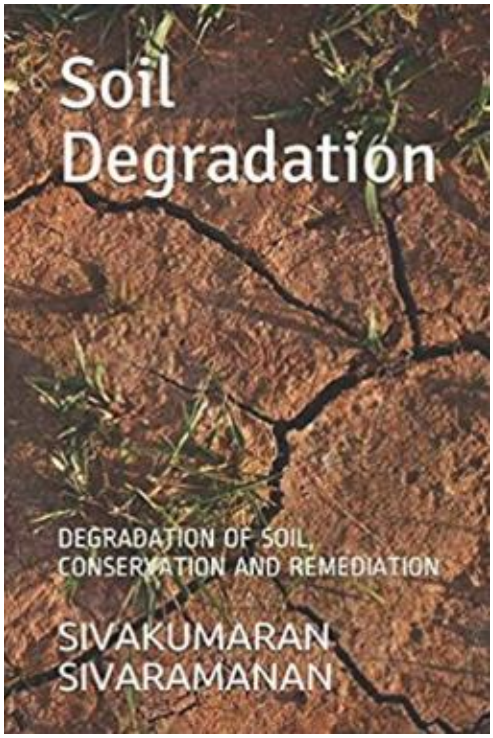
Emmanuelle Mikosz

emmanuelle.mikosz@elo.org

Details at:

https://www.europeanlandowners.org/awards/soil-land-award

New Books: Soil Degradation



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Soil degradation is one of the major global threats. Mainly in countries like Africa, Australia, China and some part of US effects of top soil erosion are being increasingly realized. According to UNCCD, globally 2.6 billion people depend on agriculture but 52% of the land used for agriculture is moderately or severely affected by soil degradation, land degradation affects 1.5 billion people globally, due to drought and desertification annually 12 million hectares are lost where 20 million tons of grain could have been grown, 74% of the poor are directly affected by land degradation, about 1 billion people do not have sufficient food and access to safe water and It had been agreed at Rio + 20 that natural capital mainly the land resources are the foundation of our society and economy, this is a major vision of the sustainable development goals (SDG s) and 2015 development agenda of the UN. This review is conducted based on the Khan Towhid Osman's book on Soil degradation, conservation and remediation published by Springer 2014. Book summarizes the contents briefly in terms of analyzing causes, soil conservation and remediation techniques.