



WORLD ASSOCIATION OF SOIL AND WATER CONSERVATION

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Cover photo: Paddy filed in desert, Yulin, Shannxi Province, China. Photographer is Huang Baolin.

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Reminder for Paper Submission of the International Youth Forum of Soil and Water Conservation

Hello everyone,

First of all, thank you for paying attention on the forum that will be held in this coming October. Much appreciated for people who have submitted an abstract to it. We are looking forward to seeing you at this forum.

As the deadline (May 31, 2015) for paper submission is fast approaching, we hope to work on development of peer-review papers for best papers selection and to release the Outstanding Youth Paper Award. If the authors are interested in pursuing this option, please submit your full paper before the end of this month to IYFSWCinf@nit.edu.cn

We are looking forward to cooperating with you. Again, please submit your full paper by May 31st, 2015 if you want your work to be scheduled as part of the best papers evaluation.

Please note: the Outstanding Youth Paper Award: will be released at this coming forum by WASWAC to encourage young scientists to contribute to soil and water conservation research. The award consists of a Certificate from the WASWAC and a \$1000 (USD) honorarium. Also, the paper will be published in the International Soil and Water Conservation Research.

(<http://www.journals.elsevier.com/international-soil-and-water-conservation-research/>)

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Report from Prof. José Luis Rubio, the representative of our association in the 3rd Global Soil Week 2015.



3rd Global Soil Week 2015

19th - 23rd of April 2015, Berlin

Dialogue Session 1.1:

“Food Security and Sustainable Food Systems: the Role of Soil”

Report

20th April 2015, 2 pm – 6pm

Organised by:

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

Abstract

There is a general consensus that healthy soils are pivotal for food security. Food production is one of the main ecosystem services provided by and thus dependent on well-functioning soils. There are also intrinsic connections between the four pillars of food security – food availability, access, utilization, and stability – with how soils are managed, accessed and secured, in particular by food insecure and vulnerable populations. On the other hand, socio-political and economic processes that precipitate inequalities and heighten vulnerabilities among poor populations often increase pressure on soils due to

unsustainable forms of land use and poor agricultural practices. This has often led to scenarios that can be described as: 'poor soils, empty stomachs (hungry people) and poor livelihoods'. In 2015, in particular, as we head towards approval of the SDGs, the role of Financing for Development is debated and agreed upon and a new climate pact is signed – these three political dimensions define how a new post-2015 agenda needs to be people-smart as well as resource-smart. For proposed SDG 2 – Food Security and Hunger, there can be no resolution without addressing people, policies and institutions.

Understanding the connections between soils and food security

Nevertheless, not all of the connections between soils and food security are clearly articulated in food debates. Is food produced in healthier soils also more nutritious? Under which contexts are soils crucial for achieving food security and under which contexts there are more urgent issues to address? These and many other questions emerge, indicating there is potential to understand, in more precise terms, how improved governance and management of soils could lead to sustainable food security.

Additionally, the connections between soils and food security needs to be integrated within broader discussions around sustainable development, in particular, sustainable food systems and their influence on the three pillars of sustainability: economic, social and environmental. In other words, we first have to envision the role of soils and food security and then discuss strategies for transforming the reality towards this goal.

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

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

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

Our expected outcomes:

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

Final Programme

Programme

Understanding the connections between soils and food security

14.00	Opening Matheus A. Zanella, IASS (Germany)
14.10	Soils and the four dimensions of food security: how are they articulated? Prof. José Luis Rubio, ESSC & WASWAC (Spain)
14.25	Scale and contexts: when soils are crucial for food security Faustin Vuningoma, Secretary-General, PELUM Association (Zambia)
14.40	First round of debate Imagining soils in a sustainable future and creating the strategies for achieving it
15.00	Transition to Working Groups
15.15	Working groups: Agroecology, sustainable food systems and soils Maryam Rahmanian, CENESTA (Iran) & Carolin Callenius, Bread for the World (Germany) Climate and agriculture agendas: resource equality and people-smart agriculture Leisa Perch, UNDP RIO+ Centre (Brazil) & Matheus A. Zanella, IASS (Germany)
16.00	Coffee Break
16.30	Continuation of working groups
17.00	Presentation of results and discussions of working groups
17.30	Last round of debate

Summary of discussions

Part 1: Understanding the connections between soils and food security

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

- (i) To clarify the connections between soils and food security on its four dimensions (availability, access, utilization, stability);
- (ii) To discuss how these connections are being treated in ongoing relevant political debates at the global level, in particular the debates on (i) food security and agroecology and (ii) food security and climate-smart agriculture (CSA).

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

Faustin Vuningoma (PELUM) offered a passionate account of his experience in working directly with smallholder farmers from Southern Africa in sustainable soil management for many years. Mr. Vuningoma agreed that the reason for food security's continued high prevalence in some areas around the world is indeed a political one, more specifically lack of political prioritization to smallholder agriculture and disregard of its capacity to sustainably feed the growing population. He critically addressed supposed simple solutions, such as distribution of fertilizers, as pretentious silver bullets to rapidly increase agricultural production, but without touching the real causes of food insecurity. Mr. Vuningoma reported real-life stories of how technological packages based on hybrid seed and chemical fertilizers ultimately created dependency and decreasing returns for smallholder farmers, besides **deviating policy attention away from more long lasting potential community-based solutions**, such as conservation agriculture, agroforestry and agroecological systems.

During the initial round of discussion, some clarification points were raised by the audience with

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

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

After a break, two working groups were formed:

- (i) Coordinated by Maryam Rahmanian (CENESTA) and Carolin Callenius (Brot für die Welt): “Agroecology, sustainable food systems and soils”, with approximately two thirds of session’s participants (50 people);
- (ii) Coordinated by Leisa Perch (Rio+ Centre) and Matheus A. Zanella (IASS): “Climate and agriculture agendas: resource equality and people-smart agriculture”, with approximately one third of session’s participants (25 people).

Before transitioning to the working group format, Ms. Rahmanian (CENESTA) and Ms. Perch (RIO+ Centre) introduced the topics of each one of the working groups, respectively.

Ms. Rahmanian mentioned that agroecology can be understood as a diverse set of production systems in which **locally-available resources for soil fertility and biological control are privileged over costly external inputs** such as chemical fertilizers and pesticides. Agroecology is gaining political momentum worldwide through active involvement of global farmer’s movements. Thus, it was the purpose of the working group to discuss the topic with “activistic lens”, i.e., finding entry point for political incidence.

Ms. Perch commented that one of current biggest challenges in the sustainable development agenda is related to how to address the **relationship between climate and agriculture through a people-centred approach**. Technological solutions will surely be needed, but these will necessarily have to be embedded in processes related to social and political aspects, such as leaning in for greater resource equality, otherwise there is a risk of significant failure. This approach is what she mentioned as “climate-smart & people-smart agriculture”, and the purpose of the working group was to discuss if this perspective was being considered when addressing soil policies around the world and in what context.

The following tables present a summary of the discussions held within each working group.

Working Group 1: “Agroecology, Sustainable Food Systems and Soils”

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

Agroecology uses ecological concepts and principles for the design and management of sustainable agricultural systems in which natural, locally-available resources for soil fertility and biological control are privileged over costly external inputs such as chemical fertilizers and pesticides. Healthy soils are just one element, just as water or biodiversity, in making this farming system successful.

But Agroecology is far more than being a production system alone. It comprises the food system as a whole. So it includes social and political aspects of rights, access to markets, decision making, and far more. La Via Campesina, the world wide alliance of small holder peasants formulated in the Declaration of the International Forum for Agroecology (25.02.2015) a common understanding of Agroecology and described strategies¹.

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

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

Agroecological systems are deeply rooted in the ecological rationale of traditional small-scale agriculture; farming systems characterized by a diversity of food, seeds, and knowledge on interactions between soil, water and biodiversity management regimes in the specific context. These knowledge systems also need to be sustained, as in their diversity they increase resilience.

Moreover, Agro-ecology implies access of small-scale farmers to land, seeds, water, credit and local markets, partly through the creation of supportive economic policies, financial incentives, market opportunities and agroecological technologies.

In addition to the practices of the farmers themselves, Agroecology as a movement also includes scientists and social movements. They are also asking central questions of power relations: who owns

1

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

the food and controls the food system? Being part of this movement poses new challenges for scientists requiring a need to understand farmers in the context of their farming systems and thus making research results more relevant to their needs.

Challenges ahead:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

One additional remark addressed by participants was related to which governance structures are needed to continuously identify and respond to these challenges. One discussion point noted was the scale of decisions, that is, that while most of agricultural practices that touch upon soils are conducted

at the local level, its implications are global. The need to bridge local and global (glocal) became part of the mainstream discourse in sustainable development decades past. Still how to make this an effective operating principle is still a very present-day challenge. Another point was the need to continuously seek governance structures that allow as many stakeholders as possible to analyse the situation and participate in decision-making (participatory, inclusive, bottom-up structures – that are many terminological examples that illustrate this point). Once again, the group identified this is a huge challenge where more focus is needed on the “how” rather than the “what”.

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

Conclusion and Follow-up

In the last part of the session, there was a brief reporting back from each of the groups to the plenary leading to discussion about possible follow-up activities. Two suggestions emerged:

To keep, within Global Soil Week working programme, a specific and dedicated stream to further refine the connections between food security and soils on a comprehensive manner, instead of only addressing them as attachments to other topics. The session was one of most attended ones of the event² which clearly indicates that there is a demand from Global Soil Week participants to further advance discussion on agroecology, sustainable food systems and food security;

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



² 75 persons with 95% of participants staying from the beginning to the end; half of the Young Professionals were at this session, almost all in the agroecology working group.

MEETINGS

World Congress on Integrated Crop-Livestock-Forest Systems

Place: Brasilia, Brazil

Time: July 12-17, 2015.



world congress on integrated
crop-livestock-forest systems

3rd International Symposium on Integrated Crop-Livestock Systems
towards sustainable intensification • brasilia • brazil • 2015

Sponsor

  Dow AgroSciences

Organizer

Support

Partnership

Promotion and Execution

 **12 - 17**
july 2015

 **Ulysses Guimarães**
Convention Center
Brasília, Brazil

Embrapa is pleased to invite you to participate on the World Congress on Integrated Crop-Livestock-Forest Systems (WCCLF) and the 3rd International Symposium on Integrated Crop-Livestock Systems (ICLS3) to be held in Brasilia, Brazil on July 12-17, 2015.

Agriculture is facing an unprecedented challenge. By 2050, food needs for a growing population will demand a production expansion by 60%, and the global demand for livestock products will increase by

70%, compared to what it was in year 2000. This expansion must be mostly through sustainable production intensification, since the conversion of natural ecosystems into agriculture has large negative impacts on biodiversity, carbon storage and hydrological cycle.

Also, agriculture with excessive use of inputs such as tillage, fertilizers, pesticides and irrigation as means to increase productivity (output of food, fiber and fuel per unit area) is to be discouraged as it results in an increase in the environmental footprint (e.g. greenhouse gas emissions). Mixed farming systems combining crop, livestock and forest production integrated in the same area and with efficient use of inputs are of key importance to future food security. Integrated crop-livestock-forest systems (ICLF) are also beneficial to provide ecosystem services such as carbon accumulation, recharge of aquifers and biodiversity.

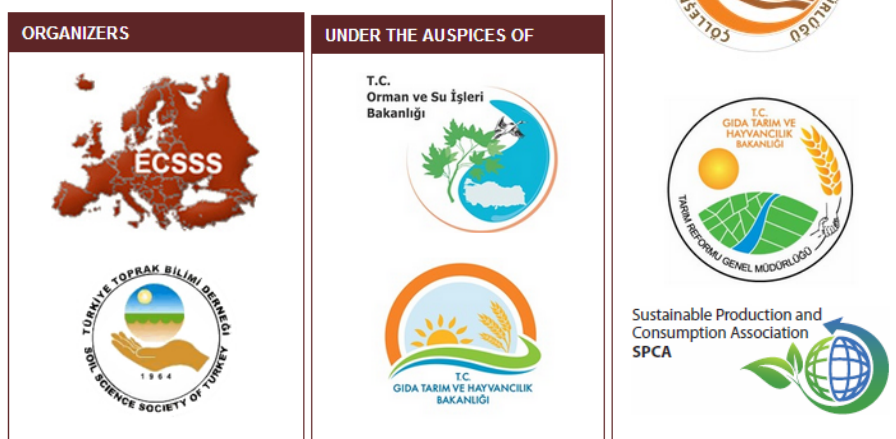
The World Congress on Crop-Livestock-Forest Systems (WCCLF) and the 3rd International Symposium on Crop-Livestock Systems (ICLS3) will provide an opportunity to update research findings on environmental conservation/impacts and economic outcomes and technological innovations. The WCCLF will also be a rich forum for sharing research based knowledge and experiences from different biomes worldwide and address the challenges to increase adoption of mixed farming systems such as ICLF.

The meeting will be structured around three main themes: Technology, Environment and Socioeconomics. There will be a recap of the main findings and needs of each session (Daily Wrap Up) finishing with a Congress Wrap Up which may generate a document to be presented in a Side Event during the Conference of the Parties of the UN Framework Convention on Climate Change (COP 21) by the end of 2015.

Join us in this opportunity to tell experiences of smallholdings and large-scale farms, present socioeconomic results, environmental improvements and technological innovations on a scientific basis. We will provide the of-the-art analysis on mixed farming and other mixed systems (crop/livestock, agroforestry and silvopastoral) on a wide range of biomes worldwide. Participants will also have a whole day to visit ICLF farm and sites during the dry season of the Brazilian Cerrado (savanna).

We are looking forward to organizing an international event to be remembered as a landmark towards the development of integrated crop, livestock and forest systems.

For details see: <http://www.wccf2015.com.br/>



Dear Colleagues and Friends,

As President of European Confederation of Soil Science Societies (ECSSS) and of 5th EUROSOIL International Congress, I am delighted to invite you to Istanbul to participate in the EUROSOIL Congress that will be held between **17 July and 22 July 2016**.

Following the successful 4th EUROSOIL Congress in 2012 in Bari, we have now a great pleasure to welcome you in **Istanbul**, one of the most attractive, historical, and cultural cities in the world.

EUROSOIL 2016 will be a unique opportunity to provide an outstanding setting for all participants including young soil scientists, researchers, technical and Professional operators, company representatives and policy makers to share their projects, scientific experiences, innovations and ideas about the soil science.

The choice of the keynotes and invited speakers who will be chosen from not only Europe but all continents of our globe will set high standard and new visions in the field of soil science. Sessions covering all aspect of soil science and social and cultural events will help culminating the success of the Congress.

One of the most important aspects of the Istanbul congress is the “Young Soil Scientists Forum” in the Congress Programme. We hope the young soil scientists drafting a declaration that can be published for the future of world soil science.

We are looking forward to receive participants from all over the world in Istanbul and to help us making all together the congress an unforgettable scientific event and feel the fascinating atmosphere of this world metropolis.

Let's meet in Istanbul in 2016!

Sincerely yours...



Prof. Dr. Ahmet Mermut

President of ECSSS and EUROSIL 2016

Important Dates

Symposium Topic Deadline	15 May 2015
Abstract Submission	16 May - 1 October 2015
Announcement of Accepted Abstracts	5 December 2015
Earlybird Registration	5 September 2015 to 18 January 2016
Regular Registration	18 January 2016 to 3 June 2016
Late Registration	After 3 June 2016

Details at: <http://www.eurosoil2016istanbul.org/#>

VENUE:
Istanbul Grand Cevahir Hotel
Convention Center



JOBS

1. 1 postdoctoral researcher and 1 PhD student in Earth Observation of Water and Vegetation



TECHNISCHE
UNIVERSITÄT
WIEN
Vienna University of Technology



The candidates will work within the EO-WAVE project (<http://eowave.geo.tuwien.ac.at>), which aims at improving our understanding of the role of soil moisture in driving global vegetation and carbon cycle dynamics. The project will use novel long-term remote sensing datasets of the water cycle, land, atmosphere, climate, and vegetation to 1) assess the impacts of climate change on the global water cycle and 2) quantify the effects of changes in the global water cycle, in particular changes in drought occurrence and severity, on vegetation and carbon sequestration. This new knowledge will be used to benchmark and improve ecohydrological processes in state-of-the-art Dynamic Global Vegetation and Earth System Models in cooperation with international land surface modelling groups.

Postdoctoral researcher

Qualifications

- PhD degree in remote sensing, climate sciences, environmental sciences, meteorology, physics, statistics, informatics, (eco-)hydrology, physical geography or similar, with a focus on land surface processes.
- Experience in remote sensing
- Track record of publications in high-quality, peer-reviewed international journals
- Good programming skills (e.g. in Python, Matlab, C++)
- Good written and spoken communication skills in English
- Land Surface Modelling experience is an asset
- Willingness to spend extended research visits at international partner institutes

What we offer

The position is limited to 3 years; expected beginning is 1 October 2015. Weekly working hours: 40. The salary is based on the Austrian regulations for university staff. The monthly minimum for 40 hours per week is 3.546,00 Euro (before taxes, 14 times a year).

PhD-student

Qualifications

- Master degree in remote sensing, geo-information, geodesy, climate sciences, environmental sciences, meteorology, physics, statistics, informatics, (eco-)hydrology, ecology, physical geography or similar.
- Good programming skills (e.g. in Python, Matlab, C++)
- Good written and spoken communication skills in English
- Experience in remote sensing is an asset
- Land Surface Modelling experience is an asset
- Willingness to spend extended research visits at international partner institutes

What we offer

The position is limited to 3 years; expected beginning is 1 October 2015. Weekly working hours: 30. The salary is based on the Austrian regulations for university staff. The monthly minimum for 30 hours per week is 1991.18 Euro (before taxes, 14 times a year).

Working environment

The Remote Sensing Research Group is one of the world-leading groups in microwave remote sensing of the Earth surface. We offer a pleasant, amicable, and flexible working atmosphere and an excellent IT infrastructure, including high-end desktop PCs, a central file system and code repository, and direct access to supercomputing facilities. Our institute is located in the heart of Vienna, one of the world's most liveable cities. A wide range of cultural and leisure activities (e.g. hiking, climbing, skiing, and cycling) are just around the corner.

How to apply:

Send your application with all information included (motivation letter, CV, list of publications) in one single PDF file to **Dr. Wouter Dorigo** at Wouter.dorigo@tuwien.ac.at. The deadline for applications is **15 June 2015** (or until fulfilled).

For further information, contact **Dr. Wouter Dorigo** at Wouter.dorigo@tuwien.ac.at.

2. OCE Postdoctoral Fellowship in Microbiology



www.csiro.au



- **Excellent career development opportunity**
- **Structured postdoctoral training program**
- **Investigate the environmental conditions under which fungi will mobilise and precipitate gold**

Postdoctoral Fellowships at CSIRO provide opportunities to scientists and engineers, who have completed their doctorate and have less than three years relevant postdoctoral work experience. These fellowships will help launch their careers, provide experience that will enhance their career prospects, and facilitate the recruitment and development of potential leaders for CSIRO.

As the successful candidate for this unique postdoctoral opportunity, you will test and quantify the role of fungi in the biogeochemical cycle of gold, in a variety of mineralised environments. You will document the environmental conditions under which fungi will mobilise and precipitate gold. An additional component of the research will investigate the possibility of determining current genetic profile (bacteria, fungi, Archaea) of gold-enriched regolith of Tertiary age which will potentially add a new level to our understanding of biological gold cycling.

You will carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.

Specifically you will:

- conduct laboratory and field experiments for identifying the role of fungi in gold mobilisation and precipitation in soil and regolith environments;
- determine the nature of microbial communities including fungi in soil and quantify the role played by microorganisms in the biogeochemical cycling of gold;
- undertake regular literature reviews , produce high quality papers suitable for publication and presentation;

- contribute to the development of innovative concepts and ideas for further research;
- communicate well and work collaboratively with external colleagues and clients, across CSIRO and within your team;
- adhere to the spirit and practice of CSIRO's Values, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals.

Location: Kensington (Perth) Western Australia

Salary: AU \$81K to AU \$88K plus up to 15.4% superannuation (pension fund)

Tenure: 3 year term

Ref No.: WA15/01342

To be considered you will hold a Doctorate (or will shortly satisfy the requirements of a PhD) in Microbiology or a related discipline, with experience and/or an active interest in biological processes relating to regolith and soils formation and metal transportation.

You will also have:

- excellent communication skills, including a record of publications in quality, peer reviewed journals;
- an ability to contribute new ideas and expertise to the development of biological processes of regolith and geochemical anomaly formation;
- familiarity with state-of-the-art microscopy techniques, inductively coupled plasma mass spectroscopy (ICP-MS) and molecular microbial techniques, particularly linked to extracting and amplifying degraded DNA;
- substantial experience working with microorganisms, including the identification of fungi and other microorganisms and the promoting and inhibiting of fungi growth in laboratory environments;
- an ability to work effectively as part of a multi-disciplinary research team, plus the motivation and discipline to carry out autonomous research;
- a record of science innovation and creativity, plus the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

Owing to terms of the fellowship, candidates must not have more than 3 years of relevant Postdoctoral experience.

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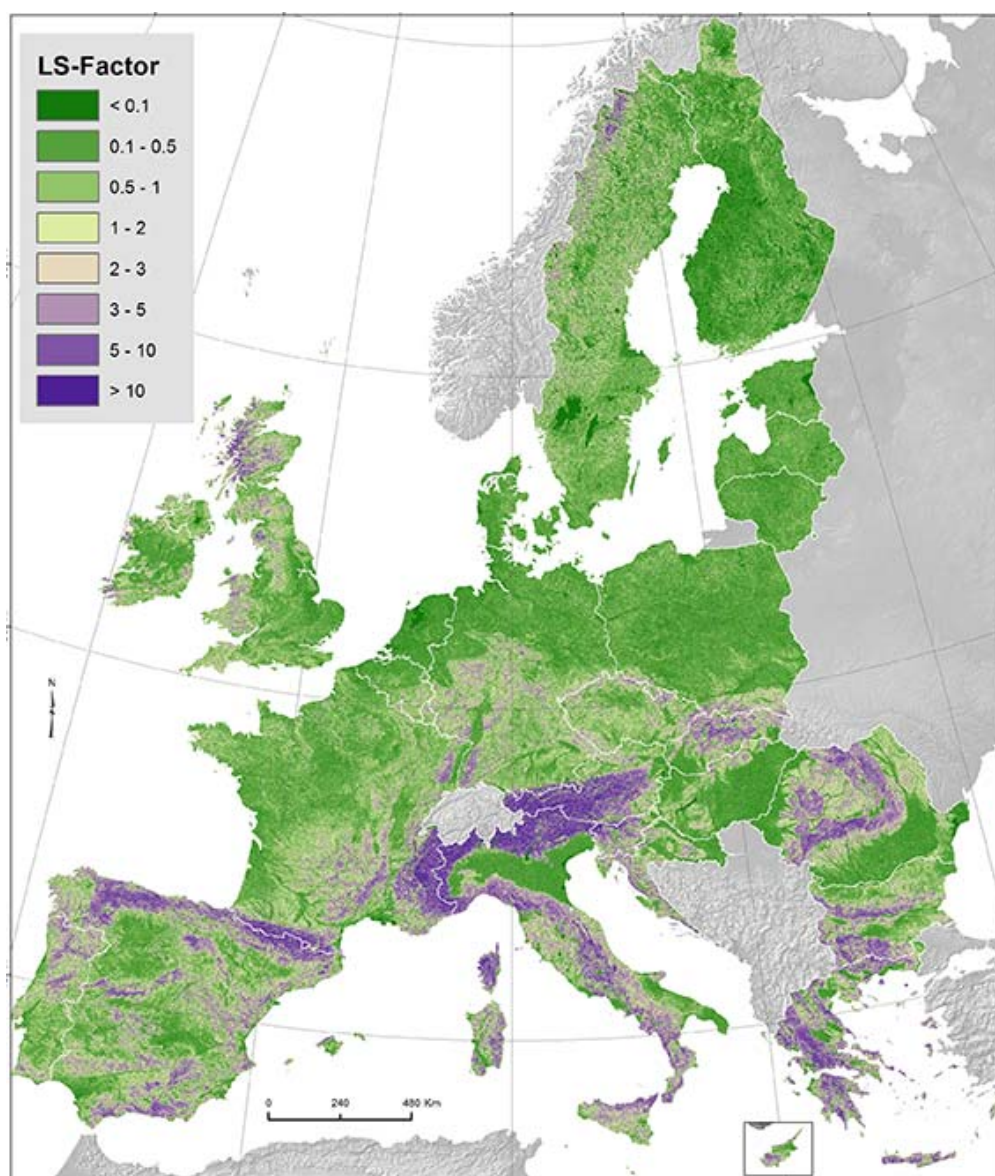
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Slope Length and Steepness factor (LS-factor)



LS-Factor - Introduction

The Universal Soil Loss Equation (USLE) model is the most frequently used model for soil erosion risk estimation. Among the six input layers, the combined slope length and slope angle (LS-factor) has the greatest influence on soil loss at the European scale. The S-factor measures the effect of slope steepness, and the L-factor defines the impact of slope length. The combined LS-factor describes the effect of topography on soil erosion. The European Soil Data Centre (ESDAC) developed a new pan-European high-resolution soil erosion assessment to achieve a better understanding of the spatial and temporal patterns of soil erosion in Europe. The LS-calculation was performed using the original equation

proposed by Desmet and Govers (1996) and implemented using the System for Automated Geoscientific Analyses (SAGA), which incorporates a multiple flow algorithm and contributes to a precise estimation of flow accumulation. The LS-factor dataset was calculated using a high-resolution (25 m) Digital Elevation Model (DEM) for the whole European Union, resulting in an improved delineation of areas at risk of soil erosion as compared to lower-resolution datasets. This combined approach of using GIS software tools with high-resolution DEMs has been successfully applied in regional assessments in the past, and is now being applied for first time at the European scale.

LS-factor in Europe

Title: Slope Length and Steepness factor (LS-factor)

Description: The LS-calculation was performed using the original equation proposed by Desmet and Govers (1996) and implemented using the System for Automated Geoscientific Analyses (SAGA), which incorporates a multiple flow algorithm and contributes to a precise estimation of flow accumulation.

Spatial coverage: European Union (28 Countries)

Pixel size: 25m and 100m

Measurement Unit: Dimensionless

Projection: ETRS89 Lambert Azimuthal Equal Area

Information: Panos Panagos, Pasquale Borrelli, Katrin Meusburger*

European Commission, Institute of Environment and Sustainability, Land Resource Management Unit
AND *Institute of Environmental Geosciences, University of Basel

References:

A complete description of the methodology and the application in Europe is described in the paper:

Panagos, P., Borrelli, P., Meusburger, K. (2015) A New European Slope Length and Steepness Factor (LS-Factor) for Modeling Soil Erosion by Water. *Geosciences*, 5: 117-126.

Data - Maps

The LS-factor dataset is in Raster format. The public user can download 2 different resolution datasets :

- 100m resolution for the Whole Europe
- 25m resolution per country.

To get access to the data, please compile the online form; instructions will then follow how to download the datasets: <http://eusoils.jrc.ec.europa.eu/library/themes/erosion/Topography/>



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(For applicants from all countries)

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Phone:..... Fax:.....
Emails (Please give at least 2 addresses to ensure uninterrupted contact): (1).....
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Dr. Xiaoying Liu. WASWAC Treasurer, c/o IRTCES. No. 20 Chegongzhuang Road West, Beijing 100048, China. Tel: +86 10 68786413; Fax: +86 10 68411174; Email: waswac@foxmail.com; waswac@163.com. Membership fee can be sent through **Check, Bank Draft, Bank Transfer** and **WESTERN UNION**.

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