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Discussion: Food security and sustainable food systems: The role of soil[☆]

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Editorial notes

This discussion is edited from a dialogue session of '3rd Global Soil Week 2015' (globalsoilweek.org). The 'Global Soil Week' (GSW) is a multi-stakeholder platform of high-level policy-makers, scientists, NGOs, CSOs, farmers, artists, international organizations, and the private sector. One of the main purposes of the GSW is to raise public awareness of the issues of soil and land. The 'Global Soil Week' advocates soil management in the context of sustainable development and promote equitable access to land. The '3rd Global Soil Week 2015' was held from 19 to 23 April 2014 in Berlin. The session, on April 20 2015, 2015, discussed the topic of 'Food Security and Sustainable Food System: the Role of Soil'.

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

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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 practises. 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 ‘Sustainable Development Goals’ (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

Not all 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 into 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 social-ecological resilience of food systems.

Initially, the session discusses 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 further consensus on the links 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 catalyse action on food security in the context of the SDGs.
- Identify potential new coalitions that could transform pathways to sustainable food security into 2030.

Summary of discussions

Part 1: Understanding the connections between soils and food security

With an audience of 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* in the context of its four dimensions (availability, access, utilization, and 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) 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 discussed as important restrictive factors regarding the dimensions of availability, access and stability of food security. Professor Rubio also commented 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 parts of the globe was also observed. In his concluding remarks, Professor Rubio balanced optimistic and more realistic visions on how soils are being treated in political agendas. While on the one hand *soils are increasingly being regarded as 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 insecurity'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-faceted 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-term, but with several unintended consequences in the long-term, *including soil exhaustion and complete dependency on external inputs for soil fertility management*. Considering the increasing 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) Co-ordinated by Maryam Rahmanian (CENESTA) and Carolin Callenius (Brotfür die Welt): “*Agroecology, sustainable food systems and soils*,” with approximately two-thirds of the session's participants (50 people).
 (ii) Co-ordinated 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 the 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 suggested 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 world-wide through active involvement of global farmer's movements. Thus, it was the purpose of the working group to discuss the topic with "activistic lenses," i.e., finding entry points for political engagement.

Ms. Perch commented that one of current major 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 promoting greater resource equality, otherwise there is a risk of significant failure. This approach is what she mentioned as "*climate-smart and 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"

By 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 preferred to expensive 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 strategies.^a

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 hands of smallholders? If prices of fertilizers are rising, the cost is quickly beyond the economic capacity of smallholders, also depleting the soil nutrient fund. Sustainability of production, also for the next generation, is central for agroecology. Technological fixes often prove to be inadequate to deal with 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, agroecology 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 practises 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 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 or regional level. 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 an improved 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 rural agricultural production.

In the Sustainable Development Goals (SDGs), the term Agroecology is not used. 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 issues for smallholders' 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 honest brokers. 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. Along with this, transparency should also be increased how finances for science are linked to the increased objectivity of research systems.

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

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

By 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 centre of climate change discussions. In particular, how to adapt agricultural systems to increasing climatic changes has suddenly become amongst the main 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. Firstly, 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 with whom we communicate. To have and keep diversity therefore seems crucial.

Secondly, discussants also highlighted that if solutions are not embedded in social and political processes, technologies run the risk of failing to integrate the three dimensions of sustainable development. 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 accord with more recent and progressive understanding of 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 its nutritional dimension. Moreover, other issues that appeared more recently in the food security discourse (for example, food waste). 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 an 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 agricultural practises 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 that 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” and “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.

Conclusions 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:

1. To keep, within Global Soil Week working programme, a specific and dedicated stream to further refine the connections between food security and soils in a comprehensive manner, instead of only addressing them as attachments to other topics. The session was one of most attended ones of the event,¹ 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.
2. To initiate a 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.

¹75 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.