

Towards a Global Soil Partnership for Food Security and Climate Change Mitigation and Adaptation

1 Introduction

On the basis of the recommendation of FAO's High-Level External Committee (HLEC) on the Millennium Development Goals to the Director-General (13-14 October 2009) and the discussions and conclusions from the 22nd Committee on Agriculture (COAG) on the 16th-19th of June 2010, preparatory activities have been initiated to develop a vision statement, strategy and action plan towards the establishment of a Global Soil Partnership (GSP) for Food Security and Climate Change Adaptation and Mitigation.

As information on this new initiative of FAO is spreading to the numerous stakeholders in the world, expectations on this new partnership are growing. There is a clear perception by many institutions and stakeholders at global, national and local level that such a partnership is urgently needed. The renewed recognition of the central role of soil resources for assuring food security and the increased awareness that soils play a fundamental role in climate change adaptation and mitigation has triggered numerous projects, initiatives and actions that need an increased effort of coordination and partnership in order to avoid un-necessary duplication of efforts and waste of resources, especially in times of substantial budget restrictions. The added value of the GSP in developing synergies and cost savings among the various existing networks and programs will assure that the partnership receives the necessary support and endorsement by all major players and stakeholders.

The GSP will aim towards collaboration and sharing of responsibilities so as to provide a coherent framework for joint strategies and actions. Soils can be considered as non-renewable in the time frame of human activities. There is increasing degradation of soil resources due to population pressures, inappropriate practices and inadequate governance over this valuable resource. The GSP should aim at facilitating the dialogue and interaction among the various users and stakeholders currently competing for the use of soil resources at global scale. This will complement similar initiatives for water (the Global Water Partnership) and land (Voluntary Guidelines on the Responsible Governance of Tenure of Land and Other Natural Resources (VG)).

Soil is important for mitigating climate change and its management can support human adaptation efforts. Soil is at the same time both a source and a sink of greenhouse gases. This is a delicate balance between sink and source function. Soil not only contains worldwide twice as much carbon as the atmosphere. The flux of carbon dioxide between soil and the atmosphere is also large and estimated at ten times the flux of carbon dioxide from fossil fuels. Waterlogged and permafrost soils hold major stocks of carbon but also are important emitters of two other non-CO₂ greenhouse gases, methane and nitrous oxide.

Soils provide the basis for food production. Fertile soils are limited and are increasingly under pressure by competing land uses for cropping, forestry, and pasture/rangeland but also for energy production, settlement and infrastructure, raw materials extraction, etc. Maintaining the needed minimum amount of soils for feeding the growing population of the world and meeting their needs for biomass (energy), fibre, fodder and other products should be one of the guiding principles of the GSP. As should be maintaining soil/land uses that allow to also sustain the other ecosystem services on which our livelihoods and societies depend including water regulation and supply, climate regulation as well as

biodiversity conservation and other cultural services. Increasing soil degradation processes due to land use changes are threatening this resource and urgent action is needed to reverse this trend if we want to assure the necessary food production for future generations. The sustainable and productive use of the soil resources of the world should therefore be the ultimate twinned goal of the GSP.

2 Vision and Mission

The Global Soil Partnership's vision is for a sustainable and productive use of the soil resources of the world.

The Global Soil Partnership's mission is to support and facilitate joint efforts towards sustainable management of soil resources for food security and climate change adaptation and mitigation.

3 Strategic Objectives

Through enhanced and applied knowledge of soil resources as well as improved global governance and standardization, the Partnership will:

- Create and promote awareness among decision makers and stakeholders on the key role of soil resources for sustainable land management and sustainable development;
- Address critical soil issues in relation to food security and climate change adaptation and mitigation;
- Guide soil knowledge and research through a common global communication platform incorporating real local challenges;
- Establish an active and effective network for addressing soil crosscutting issues;
- Develop global governance guidelines aiming to improved soil protection and sustainable soil productivity.

These strategic objectives will be reviewed and endorsed through a consultative process with partners.

In regard to FAO, the GSP will contribute directly to FAO Strategic Objectives F "*Sustainable management of land, water and genetic resources and improved responses to global environmental challenges affecting food and agriculture*" and A - *Sustainable intensification of crop production*¹. By ensuring sustainable use of soils, the GSP will contribute also to the Impact Focus Area on Water and Land Scarcity by assisting countries in reducing pressure on scarce and fragile land and water resources through promoting sustainable soil management in the range of production systems and addressing soils issues through their implementation of the Multilateral Environmental Agreements and World Food summit Plan of Action. These strategic objectives and their specific organizational results will be underpinned by two basic principles:

- interdisciplinarity, to address multisectoral soil related issues by mobilizing contributions from all relevant disciplines within the Organization; and
- partnership, among FAO units and with governments, organizations (UN and non-UN) and programmes and civil society working on soils.

Likewise, the GSP will be linked to the strategic objectives and expected results of the European Commission and other partners.

4 Partners

¹ Document C2011/3 programme of work and budget 2012-2013, 37th FAO Conference, June 2010

Main partners will include all those international, regional and national bodies that are conducting substantive work on soil protection and sustainable management, inter alia:

- International agencies and projects with a global soils mandate and/or activities;
- Regional and national soil science associations and networks;
- National soil research institutes and academic institutes (universities);
- Representative of civil society organization (i.e. International Federation of Agricultural Producers-IFAP; International Federation of Organic Agriculture Movements -IFOAM) and the private sector.

The proposed main areas of action of the GSP have been identified through initial consultations by FAO and JRC with key partners such as ISRIC, ICRAF, IRRI, etc and national soil survey agencies.....etc. and through a number of recent international and regional workshops on soils in relation to food security and climate change, inter alia:

- International technical workshop on Investing in sustainable crop intensification: The case for improving soil health (FAO, Rome, 22-24 July 2008 <http://www.fao.org/docrep/012/i0951e/i0951e.pdf>)
- Monitoring, Reporting and Verification systems for carbon in soils and vegetation in ACP countries organized by the European Commission/JRC (Brussels, 26 January 2011)

Expert preparatory meeting on climate change adaptation and mitigation for the High-Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy, (5-7 March 2008 http://www.fao.org/fileadmin/user_upload/foodclimate/presentations/EM1/OptionsEM1.pdf)

5 Pillars of the Global Soil Partnership

In order to achieve the aforementioned objectives, it is proposed that the GSP should address four main pillars of action:

1. Harmonization and establishment of guidelines and standards of methods, measurements and indicators;
2. Strengthening of soil data and information: data collection, validation, reporting, monitoring and integration of data with other disciplines;
3. Promoting targeted soil research and development focusing on identified gaps and priorities and synergies with related productive, environmental and social development actions.
4. Promoting sustainable management of soil resources and improved global governance for soil protection and sustainable productivity.
5. Encouraging investment and technical cooperation in soils

The main areas of action of the GSP will be further developed during the extensive stakeholder consultation process that will be conducted by FAO with partners over the next months. A first outline is provided below.

5.1 Harmonization and Standards

Harmonization and establishing guidelines and standards should not be a goal *per se* of the GSP. Standardization always implies a cost for the various stakeholders and actors and therefore a clear cost/benefit analysis needs to be provided in order to justify any standardization activity. Many standards for soil measurements, observations, data collection and data management exist. The GSP should aim to federate and facilitate a partnership among the various actors in order to develop synergies and cost savings for all partners.

Ongoing efforts by the ISO Committee TC 190 as well as standards developed by the International Union of Soil Sciences (IUSS) and by other Regional and National standardization committees and institutions, like OECD and the EU, need to be brought within a common framework that will reduce duplication of efforts and the proliferation of standards and methods that are often not compatible. A well-documented example of lack of coordination is soil classification, with still two (or more) main systems used in many parts of the world that are difficult to compare and harmonize (like the US Soil Taxonomy of USDA and the World Reference Base (WRB) of the International Union of Soil Sciences (IUSS) endorsed by FAO). The recent initiative by IUSS towards the development of a common Universal Soil Classification (USC) should be facilitated by the GSP by providing a common platform for such a future system. Indeed this would place back FAO in the leading position it had in the past in developing and maintaining a common soil classification system.

Harmonisation and the establishment of guidelines and standards should cover all aspects related to soil observation and measurement (both in the field and especially in the laboratory) this should include standards for indicators, notably the development of a shared definition among stakeholders of soil quality and soil health indicators specific for the various land uses. Previous work in the OECD framework for the development of a soil quality indicator as well as on-going work in the EU and in USA and similar initiatives in the various regions should be brought under a common framework within the GSP. The development for common standards for soil health and fertility will facilitate the implementation of Integrated Soil Fertility Management (ISFM) and support ongoing regional activities, like the Soil Health Program of AGRA and others.

The development of common standards for soil carbon sequestration is moving forward in accordance with the UNFCCC processes but is lagging behind the already established standards for above ground carbon sequestration (through C markets and REDD, REDD+ processes). Accepted and cost effective methods and techniques for Monitoring, Reporting and Verification (MRV) of soil organic carbon are needed and will be developed within the GSP. The GSP should link with the GEF funded Soil Carbon benefits project as a partnership to develop standards for soil carbon measurement, monitoring and benefit sharing.

Because of its complexity and generally invisible nature, soil biodiversity remains a subject largely retained within the research domain and hardly known to potential users because of the specialist nature of much of the work which tends to focus on specific functional groups and species e.g. soil macrofauna (earthworms etc.), mesofauna and flora, or microorganisms (rhizobacteria, mycorrhiza, etc.). There is a need to bring such knowledge into the development sphere where it can be valuably used to enhance productivity, reduce losses from soil pests and diseases, restore degraded soil structure, detoxify polluted soils, and so forth. Standard methods and tools could be of great use in making better use of soil biological and ecological knowledge. The GSP should develop leadership for soil biodiversity within the CBD process and support the newly established Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

Standardization is particularly beneficial for data management and integration. Adopting common standards for soil data will allow integration of soil information within wider spatial information systems for wider agricultural, environmental and land use planning objectives. Data interoperability and shared definitions and metadata catalogues will facilitate data access and use. Standardization at a global scale, like the Global Spatial Data Infrastructure (GSDI) and Open Geospatial Consortium (OGC), as well as Regional initiatives, like the Infrastructure for Spatial Information in the European Community (INSPIRE) directive of the EU, should be taken into account for the establishment of common standards for geo-referenced soil data and information. There is a need to develop a global soil information standard that would allow access and use of data across

a broad range of international initiatives (such as the Global Earth Observation System of Systems (GEOSS) and INSPIRE) as well as supporting national, regional and local data interoperability and integration. The GSP could act as a facilitator for these various global and regional standardization efforts.

5.2 Strengthening soil data and information

Some of the existing global soil data are rather obsolete and at coarse resolution. Current global databases are still essentially using a mixture of information collected more than 50 years ago at the time of the compilation of the first global soil map by FAO/UNESCO and subsequently the more recent collection of new soil data under SOTER (Soil and Terrain Database) and other Regional or national programs. The most recent Harmonized World Soil Database is essentially a compilation of these existing soil data into a common raster at 1 km resolution. There is an urgent need for updated high-resolution data and information on global, regional and local soil resources, both for food security and for climate change related issues. Detailed and updated information on soil health and fertility as well as on soil organic carbon content is missing in many countries.

Several new projects have been initiated aiming towards the rapid compilation of new digital soil maps of the world. The GlobalSoilMap.net consortium, partially funded by the Bill and Melinda Gates foundation, as well as the EU funded eSOTER project within the Global Soil Data task of the GEO/GEOSS work program are the most relevant on-going initiatives. In addition, a number of Regional and National soil data collection programs are on-going, like the Africa Soil Information Service (AFSIS), the European Soil Information System (EUSIS) and others. A main task of the GSP will be to build a partnership among the various soil data collection programs in order to develop synergies and cost savings by avoiding duplication of efforts. Ultimately the GSP should provide a common soil data and information platform responding to the various user needs at global, regional, national and local scales. Providing the soil data and information needed by the end users should be a guiding principle of the GSP, avoiding past experiences of large-scale data collection programs that fail to deliver specific data relevant to actual user needs and capitalizing on the various ongoing processes. An extensive survey of the actual end user needs and requirements should be part of the work program of the GSP from its early stage.

5.3 Promoting target soil research and development

There is a large number of research activities and projects related to soils around the world. Many projects would benefit from an increased coordination with other on-going research activities. Communication among the research communities dealing with the various aspects of soils are often limited or inexistent and interdisciplinary research is still very limited. Bridging between the various research communities could bring large benefits to the global scientific knowledge base and lead to more coherent soil related activities. Breaking the still existing walls between geology, soil science, agronomy, forestry, pasture/rangeland management, agro-climatology, soil biology and ecosystems research could improve the quality and applicability of research and provide new avenues for future integrated research and development programs.

The GSP should closely link to new global research initiatives, like the Global Alliance for GHG Research in Agriculture, and should also provide input and support to the main scientific advisory bodies of the three Rio Conventions: IPCC for the UNFCCC, IPBES for the CBD and the reformed CST for the UNCCD. Soils are a crosscutting theme in all the three conventions and, as already identified in the Millennium Ecosystem Assessment, could provide a framework for the development of synergies in UNFCCC, CBD and UNCCD implementation. The GSP is ideally placed for further developing such a crosscutting soil-based theme in the preparation process for the Rio+20 conference.

As and when the GSP is adopted and implemented, the mechanism should be able to identify and support main research lines on the range of soil issues that are relevant to the main activities undertaken by different organizations and institutions dealing with food security, climate change adaptation and mitigation, sustainable soil resources management as well as water supply and quality.

5.4 Promoting sustainable management of soil resources and soil protection

For applied policy reasons and global soil governance there is an urgent need to update the vision and guiding principles spelled out some 30 years ago in by FAO in the World Soil Charter (FAO, 1981). The 13 principles listed in the charter are still valid, but need to be updated and revised in light of the new scientific knowledge gained over the past years, especially in relation to the crucial role that soils play in climate change mitigation and adaptation. New guidelines for action as well as follow-up activities should be identified, taking stock of the past experiences and learning from the failures and mistakes that have resulted in a still persistent global problem of soil degradation and unsustainable use of available soil resources.

The GSP should become the platform for discussion among policy makers and stakeholders on the best way forward to achieve measurable soil protection targets in a reasonable time frame. New issues rising from increased pressures on fertile soil resources leading to "land grabbing" processes and persisting problems relating to land tenure could be incorporated in such a renewed soil charter. Special attention should be paid to ethnopedology (indigenous soil management) as it has shown its importance in sustainability. Ideally the GSP should facilitate the compilation of a new World Soil Charter incorporating the new knowledge and experiences gained over the past 30 years. The Rio+20 meeting could be an ideal venue for the presentation of this new World Soil Charter by the GSP.

5.5 Encouraging investment and technical cooperation in soils

The GSP should develop guidelines and recommendations on investment and technical cooperation in soils and how to mobilize investments through ongoing processes:

- Investment by farmers and other land users
- Investment by countries
- Investment by development banks, GEF and other donors

It will also assess the available soils expertise, capacities and interests of both the private and public sectors in supporting technical:

- Technical cooperation by countries' research and development agencies
- Technical cooperation and support by the UN system and international bodies.

6 Status and way forward

Strong support to FAO on this new initiative for a GSP was voiced by several countries during the 22nd meeting of the FAO Committee on Agriculture (COAG) in June 2010. The EU endorsed the vision of FAO for the GSP and offered the support of a senior official of the European Commission for a period of six months in order to:

- define a vision statement, strategy and action plan of Global Soil Partnership for Food Security and Climate Change Adaptation and Mitigation on the basis of an extensive stakeholder consultation;
- identify national, regional and global networks dealing with soil resources in an online survey and a series of preparatory meetings;

- prepare an international meeting for launching of the Global Soil Partnership in September/October 2011.

An extensive consultation process has been initiated that will culminate in a formal launch event of the GSP in September 2011. Major stakeholders and institutions involved with soil related issues at global, regional, national and local level will be consulted in order to build the GSP on the basis of the widest possible consensus and participation. Governance and organizational issues related to the GSP implementation process should not be overriding in this early phase of the definition and consultation process. Nevertheless, there will be the need to consolidate for the official launch event a clear vision of the strategy and action plan for the GSP. Over the next six months, opinions and recommendations will be collected by stakeholders at all levels and compiled into a final vision statement by FAO. Depending on the level of participation and commitment by the various FAO member countries as well as other public and private stakeholders and institutions it will be possible to draw a feasible and realistic action plan on the basis of the available resources. A first phase of the action plan should cover the period 2011-2013 with the goal of presenting as a first output of the GSP a new World Soil Charter at the Earth Summit Rio+20 in June 2012.