Draft Concept Note

Global Symposium on Soil Organic Carbon (GSOC17)

Co-organized by FAO, GSP/ITPS, IPCC, UNCCD-SPI and WMO

21 – 23 March 2017

FAO HQ, Rome, Italy

1. Introduction

In the presence of climate change and biodiversity loss, soils have become one of the most vulnerable resources in the world.[1] Notwithstanding the enormous scientific progress made to date, soil resources and their trends at national and global levels still face complicated challenges for on-the-ground policy design and implementation that varies widely from region to region. There is still a lack of sufficient international and global support for the protection and sustainable management of the world's soil resources.

Soils host the largest terrestrial carbon pool[2] and play a crucial role in the global carbon balance by regulating dynamic biochemical processes and the exchange of greenhouse gases (GHG) with the atmosphere.[3] After the burning of fossil fuels, land use and land cover change (which includes agriculture) is the largest source of anthropogenic carbon into the atmosphere[4] and within agriculture, soils have been a net source of GHGs.[5] These processes and emissions are strongly affected by land use, land use change vegetation cover and soil management.

Soil organic matter (SOM) is composed of roughly 58% carbon[6] and is a crucial soil component which affects most of the processes relevant to soil functions and ecosystem services including food production. Changing soil organic matter affects the capacity of soils to buffer against environmental change and changes the provision of ecosystem services required for crop production. It is thus closely regulating the resilience of the agricultural system to climate change. [7]

The 2015 Status of the World's Soil Resources report highlights that more carbon resides in soil than in the atmosphere and all plant life combined. However, roughly 33% of the world's soils are degraded, leading to large losses of SOM and hence soil organic carbon (SOC). As

[1] FAO and ITPS. 2015. Status of the World's Soil Resources (SWSR) – Technical Summary. Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils, Rome, Italy
[2] Scharlemann et al. 2014. Global soil carbon: understanding and managing the largest terrestrial carbon pool. http://www.tandfonline.com/doi/abs/10.4155/cmt.13.77
[3] Lal. 2013. Soil carbon management and climate change. http://dx.doi.org/10.4155/cmt.13.31
[4] IPCC. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva, Switzerland (2007).
[5] Lal. 2013. Soil carbon management and climate change. http://dx.doi.org/10.4155/cmt.13.31
[6] Pribyl. 2010. A critical review of the conventional SOC to SOM conversion factor. http://dx.doi.org/10.1016/j.geoderma.2010.02.003
[7] UNCCD-SPI. 2015. Pivotal Soil Carbon. Science-Policy Brief 01. http://www.unccd.int/Lists/SiteDocumentLibrary/Publications/2015_PolicyBrief_SPI_ENG.pdf

such, soil organic carbon is included in the monitoring of sustainable development goals (SDG) indicator 15.3.1, under which carbon stocks above and below ground is one of three sub-indicators to determine the proportion of land that is degraded over total land area. Addressing the increasing trends in soil (and land) degradation is a core challenge for sustainable development since degradation processes have adverse impacts on ecosystem services provided by soils, especially food security, water quality and availability, human health, and social and economic activities.

The reversal of soil degradation through the build-up of SOM and the sustainable management of land and soils offers large potential to improve the performance of agriculture and forestry in climate change adaptation and mitigation as reported in the climate change assessments and in national greenhouse gas inventories. This should be accompanied by the prevention of further soil carbon losses and paying attention to the local conditions and factors driving such degradation. Capitalizing on this potential may improve the global soil carbon balance by moving CO_2 from the atmosphere into the soil.[8]

The role of soils and SOC in the climate system and in the context of climate change adaptation and mitigation has been widely recognized and validated in various studies, both experimentally and through modelling.[9] However, large-scale baseline and trend assessments are still inaccurate and the influential factors on SOC in different parts of the world in relation to climate change insufficiently investigated. [10]

Guidelines for the assessment of SOC and stock changes in the context of greenhouse gas emissions have been developed by the Intergovernmental Panel on Climate Change (IPCC).[11] However, reporting on the status and trends of SOC based on measurements is a challenging task which needs to be tackled through harmonized methodologies, the collection of more data, sampling soil to greater depths for SOC analysis and using standardized sampling and modeling techniques. Initiatives aimed at improving information on the status of SOC can constitute a unique option to reinforce the current reporting to IPCC.

The Global Soil Partnership (GSP) and members of the Food and Agriculture Organization (FAO) of the United Nations are currently working on the establishment of the Global Soil Information System as a tool for countries to regularly monitor the national soil conditions. At the same time, in contribution to the sustainable development goal (SDG) indicator 15.3.1, the GSP is developing a Global Soil Organic Carbon (GSOC) map for finalization by December

[8] UNCCD-SPI. 2015. Pivotal Soil Carbon. Science-Policy Brief 01.
http://www.unccd.int/Lists/SiteDocumentLibrary/Publications/2015_PolicyBrief_SPI_ENG.pdf
[9] Lal, 2013. Soil carbon management and climate change. http://dx.doi.org/10.4155/cmt.13.31;
Frelih-Larsen et al. 2014. Soil carbon management for climate change mitigation and adaptation: framing and integrating the issue in the evolving policy environment.
http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2014/WS_3_1_Frelih-Larsen.pdf
Scharlemann et al. 2014. Global soil carbon: understanding and managing the largest terrestrial carbon pool.
http://www.tandfonline.com/doi/abs/10.4155/cmt.13.77;
UNCCD-SPI. 2015. Pivotal Soil Carbon. Science-Policy Brief 01.
http://www.unccd.int/Lists/SiteDocumentLibrary/Publications/2015_PolicyBrief_SPI_ENG.pdf
[10] Scharlemann et al. 2014. Global soil carbon: understanding and managing the largest terrestrial carbon pool.
http://www.tandfonline.com/doi/abs/10.4155/cmt.13.77
[11] IPCC. 2006. IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Agriculture, Forestry and Other Land Use

2017. The GSOC map will be compiled from national SOC maps that are being developed by member countries according to agreed product specifications and which will be shared with the Global Soil Information System. These initiatives could substantially contribute to the IPCC Sixth Assessment Report (AR6) and its products by contributing to the *Methodology Report(s) to refine the 2006 IPCC Guidelines for National Greenhouse Gas Inventories* as decided by the 44th Session of the IPCC (Decision IPCC/XLIV-L.3).[12]

During the 5th Working Session of the Intergovernmental Technical Panel on Soils (ITPS) of the Global Soil Partnership (GSP), the ITPS focused on establishing collaboration with the IPCC, UNCCD-SPI[13] and IPBES[14]. Within this context, the ITPS and the Acting Secretary of the IPCC discussed the importance of SOC in the climate change debate, with the Acting Secretary expressing the view that soils are currently only indirectly addressed in the IPCC assessment reports (ARs).[15] ITPS and the Acting Secretary of the IPCC agreed that it would be desirable to incorporate the topic of SOC in the IPCC ARs, from AR6 onwards. AR6 will be finalized in time for the first UNFCCC global stock take when countries will review progress towards their goal of keeping global warming below 2 °C.

The ITPS and the Acting Secretary of the IPCC, supported by FAO, agreed to explore the option of a jointly organized Global Symposium on Soil Organic Carbon during the first quarter of 2017 as a common platform to discuss and elaborate the latest information on the role of soil and SOC in the climate change agenda. The SPI and the World Meteorological Organization (WMO) expressed their interest to co-sponsor and co-organize the event.

The **aim** of the symposium is to review the **role of soils and SOC** in **the context of climate change** and build scientific evidence that could be **assessed in the regular IPCC Assessment Reports**, starting with the AR6 report and related products. Specifically, the symposium could contribute to the refinement of methodologies for reporting on SOC as outlined in Volume 4 (Agriculture, Forestry and other Land Use) of the *Outline of the Methodology Report(s) to refine the 2006 IPCC Guidelines for National Greenhouse Gas Inventories* which was adopted by decision IPCC-XLIV/L.3 during the 44th Session of the IPCC, and the Special Report on Climate Change, Desertification., Land Degradation, Sustainable Land Management, Food Security and Greenhouse Gas Fluxes in Terrestrial Ecosystems (SR2) agreed during the 43rd Session of the IPCC.

2. Expected Outcome

The Symposium outcome will comprise a set of scientific and strategic evidence highlighting and elaborating the various climate change related aspects of soils and SOC which could be assessed in the regular IPCC reporting, including AR6 and SR2. The ITPS, UNCCD-SPI and WMO

[12] IPCC. 2016. Sixth Assessment Report (AR6) Products. Outline of the Methodology Report(s) to refine the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. https://www.ipcc.ch/meetings/session44/l3_adopted_outline_methodology_report_guideline.pdf

[13] UNCCD-SPI = Science-Policy Interface (SPI) of the United Nations Convention to Combat Desertification (UNCCD)

[14] IPBES = Intergovernmental Platform on Biodiversity and Ecosystem Services

[15] FAO, ITPS. 2016. Report of the Fifth Working Session of the Intergovernmental Technical Panel on Soils. http://www.fao.org/3/a-bl137e.pdf

will present the workshop outcomes to the IPCC for consideration by its AR6 Scoping Meeting to be held from 1 – 7 May 2017.

3. Objectives/Outputs

The specific objectives of the Symposium are to:

1. Examine the current scientific and technical understanding of the role of soils and SOC in the climate system for carbon sequestration and adaptation;
2. Identify the potentials and limitations of soils and SOC in climate change adaptation and mitigation;
3. Enable and strengthen the provision of knowledge on soils, SOC and land degradation, as well as the interlinkages with other carbon pools in upcoming IPCC climate change assessment reports;
4. Identify options for the strengthening of existing and future IPCC technical and scientific reporting mechanisms and policy-relevant incentives;
5. Identify research gaps for coordinated research and exploration of opportunities for collaboration;
6. Identify policy options for relevant soil and SOC priorities under national climate change agendas; and
7. Produce a scientifically supported document highlighting the role of soils and SOC in the climate change agenda that could be assessed by IPCC in its regular reports, starting with SR2 and AR6.

4. Symposium Structure

The Symposium will be a scientific meeting, held over three (3) days at FAO Headquarters in Rome, Italy from 21-23 March 2017 with **300-500 participants** representing all geographical regions and countries of the world.

Leading SOC experts will be invited to provide keynote presentations on the following main themes:

- Assessment, measurement, mapping, reporting and monitoring of SOC
- Maintaining and/or increasing SOC stocks (fostering SOC sequestration)
- Peatlands and SOC in the climate change agenda
- Managing black soils (Chernozems/Mollisols) for SOC sequestration (International Network on Black Soils)

Parallel sessions will be held per the above themes, to be organized by session conveners. The format of the parallel sessions will be determined by the conveners (in close collaboration with the organizing committee) to ensure the themes are sufficiently presented and discussed in order to compile the main outcomes and key aspects that could be assessed by IPCC in its regular reports, starting with SR2 and AR6. The overarching topic of identifying policy options for soil and SOC under national climate change agendas will be included in all parallel sessions.

An outline/draft Agenda of the Symposium is presented in Annex 1.

Abstracts and papers will be invited to support the above themes and incorporate case studies form different countries. Guidelines for the preparation of abstracts and papers will be provided.

Participants will include representatives from FAO member countries, organizing institutions, relevant Panels, presenters whose abstracts are accepted and scientists working in related fields.

5. Symposium Committees

The following Committees will be established:

Organizing Committee:
This Committee will be comprised of representatives from each of the co-organizing bodies (FAO/GSP/ITPS, IPCC, UNCCD-SPI and WMO). It will oversee the overall organization of the Symposium, guide the formats of the parallel sessions, and oversee the finalization of the Symposium outcomes.

Scientific Committee:
This Committee will be comprised of representatives from the relevant panels, as well as additional leading experts in the four main themes. The Committee will be responsible for evaluating submitted abstracts and papers, as well as ensuring the scientific quality of the parallel sessions and Symposium outcomes.

6. Symposium budget

The total budget for the Symposium is **USD 450,000** which includes the following:

Item	**Budget (USD)**
Sponsored participants	290,000
Keynote speakers	
Presenters of accepted abstracts	
Participants from developing countries	
Members of the various Panels (ITPS, IPCC, SPI, etc.)	
Organization, support staff and event logistics	50,000
Translation and interpretation into six UN languages	100,000
Preparation of outcome document	60,000
Total	**500,000**

Annex 1 Programme Outline/Draft Agenda

Global Symposium on Soil Organic Carbon (GSOC17)

Co-organized by FAO, GSP/ITPS, IPCC, UNCCD/SPI and WMO

Rome, Italy, 21-23 March 2017

A Global Soil Partnership initiative

Programme Outline

Tuesday 21 March

Morning

1. Registration
2. Official Opening
    - Jose Graziano Da Silva, Director General of FAO (tbi)
    - IPCC Chair (tbi)
    - Monique Barbut, Executive Secretary UNCCD (tbi)
    - WMO representative (tbi)
    - Luca Montanarella, ITPS Chair

Plenary

3. IPCC Presentation
    - Key findings of the AR5 on agriculture and soil; expectations/needs for AR6 and SR2
4. ITPS Presentation
    - Key aspects of soils and SOC to be included in IPCC reporting
5. Keynote presentations
    - Keynote presentations by leading experts on each of the four themes

Afternoon

Parallel sessions

6. Parallel sessions per theme:

    6.1 Assessment, measurement, mapping, reporting and monitoring of SOC

    6.2 Maintaining and/or increasing SOC stocks (fostering SOC sequestration)

    6.3 Peatlands and SOC in the climate change agenda

    6.4 Managing black soils (Chernozems/Mollisols) for SOC sequestration (International Network on Black Soils)

Evening

Cocktail offered by FAO and GSP

Wednesday 22 March

All day

Parallel sessions

7. Parallel sessions per theme continue (Chairs as already mentioned above):
    - 7.1 Assessment, measurement, mapping, reporting and monitoring of SOC
    - 7.2 Maintaining and/or increasing SOC stocks (fostering SOC sequestration)
    - 7.3 Peatlands and SOC in the climate change agenda
    - 7.4 Managing black soils (Chernozems/Mollisols) for SOC sequestration (International Network on Black Soils)

Thursday 23 March

Morning

Parallel sessions

8. Parallel sessions per theme continue (Chairs as above):
    - 8.1 Assessment, measurement, mapping, reporting and monitoring of SOC
    - 8.2 Maintaining and/or increasing SOC stocks (fostering SOC sequestration)
    - 8.3 Peatlands and SOC in the climate change agenda
    - 8.4 Managing black soils (Chernozems/Mollisols) for SOC sequestration (International Network on Black Soils)
    - * Including compilation of main session outcomes and key aspects per theme that could be assessed by IPCC in its SR2 and AR6 reports

Afternoon

Plenary

9. Feedback from Parallel Sessions
    - Presentation by chairs per Parallel Session theme to provide a summary of the main session outcomes and key aspects that could be assessed by IPCC in its SR2 and AR6 reports
10. Panel (FAO, GSP/ITPS, UNCCD-SPI, IPCC, WMO) discussion on the main session outcomes
11. Conclusions and way forward to produce the Symposium outcome document
12. Closure