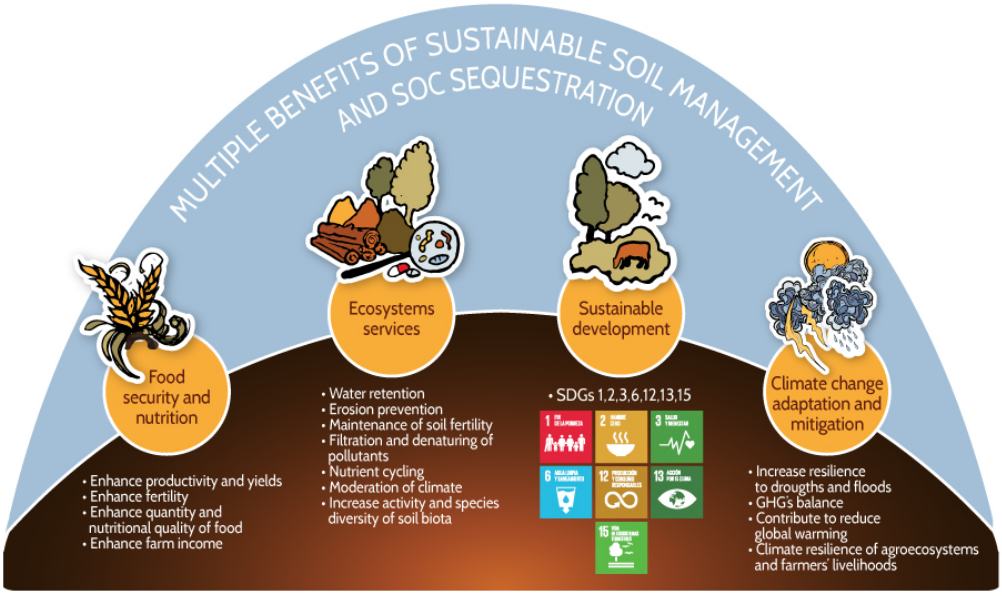
Food and Agriculture Organization of the United Nations

GLOBAL SOIL PARTNERSHIP

Online technical seminar
RECSOIL: Recarbonization of Global Soils

Organized by the Land and Water Division through the Global Soil Partnership
7 April 2020 | 10:00 – 11:00



Agenda

10:00 – 10:05	Opening remarks
10:05 – 10:15	*The role of soil organic carbon as a nature-based solution and global gaps* – **Prof Pete Smith** (University of Aberdeen)
10:15 – 10:25	*Unlocking the potential of soil organic carbon* – **Ms Rosa Cuevas Corona** (GSP Secretariat)
10:25 – 10:35	*RECSOIL: Recarbonization of global soils (agricultural)* – **Mr Ronald Vargas** (GSP Secretary)
10:35 – 10:55	Open discussion
10:55 – 11:00	Sum up and closure

Moderator: Mr. Eduardo Mansur, Director, Land and Water Division, FAO

Opening Remarks

The technical seminar "RECSOIL: Recarbonization of Global Soils" was hosted online through the zoom platform on the 7 April 2020. Mr Eduardo Mansur, Director of the Land and Water Division (CBL), welcomed the 110 participants who joined from FAO's HQ and regional offices.

The main objective of the RECSOIL discussion was summarised by Mr Eduardo Mansur as follows:

Agriculture has an impact on climate change and viceversa. Agriculture, forestry and land use is the second-largest emitter, and we always look at the agriculture for its potential and need to adapt to climate change. In decarbonizing the economy, we have a chance to recarbonize the soils, which means bringing carbon stocks in the soil. In the SDGs, there is a target (SDG 15.3: land degradation neutrality 2030); one of the metrics is carbon above ground and carbon below ground. We must measure and assess to make sure the carbon is there.

Farmers change practices to a carbon sensitive agriculture to recarbonize the soils. There are many advantages behind this, not only for mitigation and sequestration but for increasing soil fertility, soil structure, water retention and soil biodiversity. Therefore, there should be compensation for farmers who practice recarbonization of soils. Not only to recognize the importance but also to study how to compensate, premium and create mechanisms to incentivize farmers to engage in soil recarbonization.

A warm welcome was given to guest speaker Professor Pete Smith, a professor at the University of Aberdeen on Soil & Global Change, and Science Director of Scotland's climate for change in Scotland's, UK.

The role of soil organic carbon as a nature-based solution and global gaps – Prof Pete Smith (University of Aberdeen)

Professor Pete Smith discussed the role of soil organic carbon as a nature-based solution and global gaps. Climate smart soils have been around for years, which relates directly to FAOs Climate smart agriculture. The correct management of soils ensures a climate smart system of agriculture.

What can be done in agricultural soils to increase carbon and reduce greenhouse gas emissions? The global potential for agricultural greenhouse gases (GHG) mitigation indicator shows various steps to take in order to increase soil carbon and reduce GHG emissions.

The area of practice adapted and the average GHG emission reduction or removal rate will indicate the carbon sequestration potential per hectae. Ultimately, the goal is to have a high carbon on large areas. By leveraging the two factors, we can sequence a significant amount of carbon each year.

Soil Carbon Sequestration (SCS) and biochar as negative emission technologies displayed that biochar and SCS had benefits associated. It requires a limited amount of energy and significantly low negative emissions potential. It is beneficial since it is a low-cost option as it requires minimal land and has a low water requirement. Therefore, the question is, what potential is available for mitigation in the nature-based sector? What can be done through restoration and ecosystem management?

The beneficial impacts for SCS on ecosystem services and the UN SDGs are shown through a chart. It indicated the SCS have several soil functions that support the ecosystem services which are shown in natures contribution to people. The functions supported in the specific ecosystem services are connected to the UN sustainable development goals.

Professor Pete Smith emphasized that the main gap in soil monitoring is the availability of an MRV. FAO is currently developing one and hopes this will be of wide use.

Unlocking the potential of soil organic carbon – Ms Rosa Cuevas Corona (FAO-GSP Secretariat)

Ms. Rosa Cuevas presented the work of FAO on soil organic carbon (SOC) and how to unlock its potential.

As most of the soil functions rely on soil organic carbon, jeopardizing its availaibility leads to a loss of the inner soil capacity. Soil organic matter is made up of carbon mostly and is key for nutrient cycling.

SOC is the second biggest global threat to soil functions: carbon emission represents the second largest anthropogenic source of carbon into the atmosphere, while emission are an uncertain component of the global carbon cycle. However, through sustainable soil management practices, SOC stocks can be fostered on agricultural lands.

Ms. Rosa Cuevas emphasized on GSPs active work in the last four years to incorporate SOC in the global agenda. It started with the implementation of the Global Symposium on soil organic carbon (GSOC17), which set a global agenda for action.

It started with the preparation of the GSOCmap and currently, the Global Soil Organic Sequestration Potential map (GSOCseq) is in preparation. This will benefit each country as it is a step-by-step methodology, which can be used to develop national maps using the same bottom-up approach that was used to prepare the GSOCmap.

Carbon reach soils need to be conserved by establishing and implementing policies for conservation and sustainable management. The increase of the Soc content is a cost-effective option for climate change adaption and mitigation, and combat desertification, land degradation and food security, as determined by the recent IPCC report on land.

Mr. Eduardo Mansur mentioned that a reliable MRV process is fundamental, and that the effort of the GSP will help countries to improve their capacities to improve the SOC measurement.

RECSOIL: Recarbonization of global soils (agricultural) – Mr Ronald Vargas (FAO-GSP Secretary)

Mr. Ronald Vargas started presenting the challenged posed to soils from global emissions and the sustainable development agenda. The GSP proposal in relation to SOC represents a real investment while being an affordable solution. The benefit of enhancing and maintaining SOC does not only relates to food security but also to ecosystem services, sustainable development goals and climate change. Investing on sustainable soil management provides multiple benefits.

RECSOIL's mechanism will place farmers in a central position and encourage them to adopt sustainable practices. As a result, farmers will see a yield increase while using less inputs and finally carbon credits will be generated.

The step-by-step implementation of RECSOIL requires feasibility, by understanding the current stocks of carbon, examine the potentials to develop a specific program. The potential map is done through modelling at a global level by using the SSM scenarios from low to high. The next step is that every country could produce its own carbon sequestration potential map, and this is taking place through capacity development. GSP will work in hands with farmer associations that will have to implement sustainable soil practices. The farmer will benefit directly as they will receive technical support and financial incentives.

SOC sequestration is a long process, thus cannot be measured every year; the minimum cycle is eight-year. The MRV at farm level is under finalization and will be the protocol to follow for any intervention in regards to SOC. In addition, the SSM protocol will be available to measure other indicators that demonstrate other ecosystem services. It comes to financial incentives, RECSOIL includes two tools: a RECSOIL trust fund, to support subsistence farmers for providing multiple ecosystem services. A compliance certificate will be established under the Voluntary Guidelines for Sustainable Soil Management. The second tool is for private investments where Carbon credits will be generated.

Questions & Answers

1. Riccardo Biancalani To Pete: in which sense soil carbon sequestration does not use land?
   Soil carbon sequestration can be practiced without changing land use – i.e. the cropland can remain cropland and still produce food (perhaps even better!). it does not compete with land in the same way as does, say, afforestation.

2. Berrahmouni How these numbers of SOC compare according to ecological zones/ types of habitats: from example drylands, humid lands, etc...

   You tend to have more potential in humid climates than dry ones. The FAO carbon sequestration potential map will help to show which habitats/zone have the greatest potentials.

3. Mohamed AbdelMonem Do you think that using Carbon isotopes can help in evaluating the exact amount stored by soil?

   Yes, carbon isotopes (radio isotopes as well as natural abundance isotopes) are useful in establishing the pools were fresh organic matter end up, and in establishing turnover times. The are more useful in research, though, than routine monitoring.

4. Barrack Okoba In your opinion, in view of smallholder agriculture how can there practices contribute to Soil carbon sequestration? What is the motivation?

   Yes, many smallholder practices can deliver soil c sequestration. Motivation could be financial (carbon credits), but also improved drought tollerance and improved productivity.

5. Amani Alfarra Seems the biocharis a good potential low cost? am I correct ?

   Yes, it seems to be, but more research is needed on effect of biochar feedstock and pyrolysis temperature on biochar properties.

6. Tiziana Pirelli Biochar properties depends on the initial feedstock used to produce it. What are the best feedstock for producing a biochar that allows for maximum C sequestration?

   That is the subject of ongoing research, too early to pick a winner.

7. Pierre-Marie Bosc Which indicators would you recommend for smallhoder agriculture at farm level to assess the current capacity of C sequestration and further monitor the evolution ?

   The Global Soil Doctors Programme is a farmer-to-farmer training initiative to be implemented at the global level on a volunteer basis. That can be used for farmers to make an indicative estimation of the soil status and the capacity for up taking new practices that could capture SOC.

8. Alessandra Gage – DPI

   a. For those of us designing projects (with feasibility studies/etc.), where can we obtain country-specific information? (and for which countries)?

- Global Soil Information System (GLOSIS)
- SoilSTAT
- The GSOCmap
- FAO Soils Portal

   b. What would be the key recommendations for "must have" project elements in order to best facilitate recarbonization of soils / SOC?

   First of all ensure the eligibility of the project and the commitment of the farmer to implement sustainable soil management (SSM) practices, hence ensure that the practices to sequester carbon are appropriate (i.e., follow the VGSSM or the technical manual on SOC management). Correctly apply the MRV Protocol at farm scale to ensure adequate and truthful carbon monitoring across time.

9. Barrack Okoba Rosa: You have to agree that while we emphasis on MRV, we see very little done to mainstream MRV in FAO programmatic actions. How do we enforce the same just as M&E or Gender is emphasized.

   The objective of this MRV Protocol is to provide standard methodologies for the monitoring, reporting and verification of changes in SOC stocks and GHG emissions/removals from projects that adopt SSM practices at farm level.
   At the moment it is being reviewed by experts to later send it to different scientific panels (ITPS, CIRCASA, 4per1000, SPI-UNCCD, etc.) and member countries. Once finalized, it will be sent to the GSP Plenary Assembly and COAG for endorsement.

With this endorsement, it is expected that both FAO - and therefore within FAO programmatic actions- and member countries, adopt this protocol as the main tool to evaluate and monitor carbon.

10. Mohamed AbdelMonem How the farmers of the dryland can get motivated for that?

    Because according to several studies, arid zones have a high potential for carbon sequestration. It sounds challenging, but there are many scientific and practical experiences in which SOC sequestration was successful and many ecosystem services were enhanced.

11. Amy Davidson Are the tools that will be launched later in the year "digital" tools?

    Assuming that you refer to maps, yes they are digital. If you refer to field tools, they are not digital at all, as we still rely on soil samples to be collected in the field and then submitted to the lab for analysis.

12. Eugene Rurangwa Improvement and compensation of SOC in soils of the sahel region with scarce water and biomass: How can it be done? I need advice from *Prof. Smith and Ronald*

    There is scientific evidence and practical examples that SOC sequestration is possible. There are common actions such: maintain ground cover, prevent erosion, add organic amendments, reduce tillage intensity, and use perennial crops where possible. Of course, we need to be conscious that there are many dynamics that influence this process and that external events could lower down this, but that is part of the system. Yet, these basic practices can make our system resilient.

13. Benjamin Kiersch Are you in touch with WOCAT on the documentation of practices?

    Yes, we are in contact with them and some of the practices documented by them will be part of the manual.

14. Berrahmouni Certification might be costly...who will certify carbon sequestration by farmers in their farms? (need to be objective by third party...). to facilitate have access the payments/ incentives

    Within RECSOIL and in carbon marketing, the MRV (verification and certification) is done by a reliable and independent party that uses scientifically robust methodologies. It is true that this process is relatively costly, but given the aim and the investment, it merits that some resources are allocated to this important process. In RECSOIL, the costs associated with this will be part of the project per se, so the famer does not have to pay for it. Most of the investment is on the incentives for implementing the good practices, thus, the core of RECSOIL is to foster a change, but we need evidence.

15. Riccardo Biancalani Which is the planned timeframe for a farmer to see the effects and so to get the incentives?

The MRV protocol is designed for an 8-year cycle. By measuring the labile fraction of carbon and total carbon (every two and four years respectively), we can thus demonstrate that there is carbon sequestration in the short term and the associated ecosystem services.

16. abdourahman Maki A specific focus will need to be adopted to adress specificity per region. This is required to involve farmers and deliver supports. Is this in place or planned.

    We fully agree that this is context-specific, thus the manual of good practices cover all regions and agroecological zones of the world. Furthermore, the social, cultural and economic aspects of farmers per region will be considered during the feasibility phase.

17. Berrahmouni What is the relation of this planned work with Climate Smart Agriculture FAO is promoting?

    RECSOIL is a direct contribution to the CSA framework, indeed, we have developed the soil chapter of it and this is a practical approach to implement those recommendations.

18. Koumangoye Miyoubi Is there tool kit to help farmers to know more about SOC?

    Farmers have some tools available to them to explore soil organic carbon, mostly through the assessment of their soil's organic matter content. There are commercial soil testing kits that measure soil organic matter, as well as many methods that can help assess the amount of organic matter, for example through a visual assessment of soil color.

    At the Global Soil Partnership (GSP), we are working on an initiative called the Global Soil Doctors programme, which is a farmer-to-farmer training initiative to be implemented at the global level on a volunteer basis. The Global Soil Doctors Programme provides soil doctors with training, educational material and soil testing kits to build capacity on the principles of soil science and promote the practice of sustainable soil management. Through this initiative that will be launched later this year, farmers will have access to materials on the importance of soil organic matter, as well as information on how to assess different soil properties using a simple testing kit, and how these properties affect the health and quality of their soils.

19. Barrack Okoba Can we employ tools/technologies to speedup soil analysis. Lab process is slow and can be expensive. Use of validated/calibrated approaches to as
    Under the Global Soil Laboratory Network (GLOSOLAN) we have established the Soil Spectroscopy working group and we are working on the Global Soil MIR Spectral Library and the prediction service. We aimed to start combining this tool with wet chemist in order to reduce costs and be more efficient, but that will be a process as in many developing countries we still need to improve the conventional soil labs performance.

20. **Martial Bernoux** The approach presented is very sound and based on best science. However it failed under the CDMs (Kyoto Protocole) and neither was adopted largely in any Voluntary Market so far…Thus what would be the game changer for this approach to work now…even more in a context where Article 6 decisions are not yet set?

    CDM:

    Speaking broadly, some perceive the CDM to have failed (a) to advance sustainable development, (b) to have had a meaningful impact on the overall decrease in global GHG emissions (as the credits issued were applied against emissions that did occur), and (c) to have failed to have a meaningfully impact on agricultural practices, among others. In essence, these failures are perceived because the underlying goals were not achieved.

    The goal of the RECSOIL Programme is the dissemination and broad-based adoption of sustainable soil management practices that will increase SOC sequestration, but will also further sustainable development by improving yields, improving water quality, increasing farm income, etc. We were asked to consider mechanisms to obtain funding for farmers to encourage and finance their participation in the RECSOIL Programme. As such, we are pursuing a broader set of goals than the CDM.

    Speaking directly to the sustainable development goals, since RECSOIL pursues sustainable development goals that are inherent to — and inseparable from — the RECSOIL activities, and not more tenuous as has been the case in some CDM projects, achievement of these sustainable development goals will go hand-in-hand with RECSOIL's take-up rate among target farms. Thus, one could argue that mechanisms encouraging farms to participate act to further these sustainable development goals.

    Voluntary markets and Article 6:

    As a result, we are pursuing a specific goal that is different — and broader — than the CDM's goals. As the FAO has institutional constraints on its ability to run a full-fledged market-based crediting programme, we chose to align this programme with the existing carbon markets until Article 6 is resolved and implemented. Our proposal includes CDM-type elements because they are remnants that persist in the existing carbon markets. We recommend alignment with the voluntary markets (pending the finalization of Article 6) for similar reasons: it is an existing market with some inroads to new compliance markets (e.g., the link between VCS and the California/Québec ETS) and, as such, provides a good potential funding source. We do not advocate a RECSOIL marketplace initiative for the sake of a marketplace initiative in and of itself, but rather as a means of pursuing our primary goal: attracting farms to participate in the RECSOIL programme by enabling farms to fund their participation.

    The game changer:

The game changer for this proposition cannot be found in an improved MRV or in the current or future situation of the carbon markets, including Article 6. The game changer is the RECSOIL Programme itself.
In particular, the foundations of the RECSOIL Programme will be the specific plans for farmer involvement and commitment, communications and awareness, carbon market development for RECSOIL credits, financial instruments to support farmers, RECSOIL Programme's roll-out and functioning, and a long list of other critical resources and activities impossible to list in this short answer. The core competences behind these components are knowledge and experience beyond soil science per se.

21. Bernardete Neves

    a. MRV of SOC has been discussed for the last decade- are you considering developing an activity-based methodology to keep MRV costs lower? if not, why not?

The MRV Protocol is focussed on production farms where monitoring SOC variations are key. Monitoring is bases on periodical soil sampling rounds at inicial state, and every 2 yr (POC) and 4 yr (POC and SOC). Modelling of SOC Will be implemented in parallel. GHG emissions Will be estimated using IPCC GL 2006 AMD 2019.

    b. There are voluntary carbon standards (eg. VCS and in the US carbon exchanges) that account for soil carbon, and other GHG from agriculture-how is your new protocol building on them?

The MRV procedures are built on the adpaptation of VCS standards.
With regards to "activity based methodology to keep MRV low costs, we think this is feasible in countries with strong science sport (e g. Australia). If we look at a global scale, as happens with RECSOIL, most countries have not available calibrated SOC modelos nor SOC estimation methodologies (near remote sensing). This is because we need to perform a field sampling round and obtain actual SOC data.
in some years, we will can adjust our SOC modelling outcomes to actual fields data, in order to lower MRV costs.

22. Manar – CBC Building on other colleagues questions with regard to uptake by farmers, will this be incorporated into an integrated approach that focuses on building climate resilience, which goes beyond mitigation? Specifically, how will you build on other complementary ongoing initiatives in the areas of intervention?

RECSOIL is a standalone initiative as a direct contribution from the soil sector. However, this is in line with the efforts of CSA. When implementing RECSOIL, different practices involve other natural resources thus it is inherently integrated. Furthermore, as demonstrated, investing on sustainable soil management is not only contributing to climate change mitigation, but greatly also adaptation (enhancement of ecosystem services and resilience).

23. **GonzalezH** Ronald-you mentioned a RECSOIL Trust fund for farmers. Who will manage it? who will fund it? May be interesting to link to ongoing country-level GEF (or GCF) funded field activiteis

    The aim is to establish this TF in FAO and resources partners will be mainly traditional donors (countries but also private sector if they do not have a condition to place carbon credits in the market.

    It will be absolutely important if GEF/GCF could make use of the approach including the MRV into their operations.

COMMENTS

1. **Hakki Erdogan** Addition of organic amendments (compost, manure, crop residuals) can also consider as one of the indicator.

   Yes, practices that can be found in the Voluntary Guidelines on Sustainable Soil Management (VGSSM) and in the technical manual on SOC management that is currently under development.

2. **Eugene Rurangwa** For SOC MRV to be efficient, I think it would be important to partner and support National Agricultural Research Institutions and National Soil Management Institutions.

   This MRV Protocol is expected to be approved and implemented by member countries and disseminated through GSP Regional Soil Partnership. The Partnerships may contact small Farmers or Farmers Associations for their adoption.

3. **Yuriy Nesterov** Dear colleagues, FYI, as relevant to livestock production, LEAP developed guidelines on measuring and modelling soil carbon stocks and stock changes in livestock production systems. It is a very handy tool to use at the project formulation stage.

   Yes thank you, we are aware of that, at the time the GSP participated in the revision of the document.

4. **M Michela Morese** Let me share also the experience of the Global Bioenergy Partnership (GBEP) in CBC, that agreed (amongst all its Partners: around 80) a set of indicators to measure the sustainability of bioenergy. One of those indicators is meant to measure soil quality. additional info available here http://www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/Indicators/The_GBEP_Sustainability_Indicators_for_Bioenergy_FINAL.pdf

   Thank you for sharing, we will review it and contact you if we have any questions.

5. Munira Otambekova We have been helping the country to promote the CA and we are sure that this approach

   Thank you for sharing.

Related links

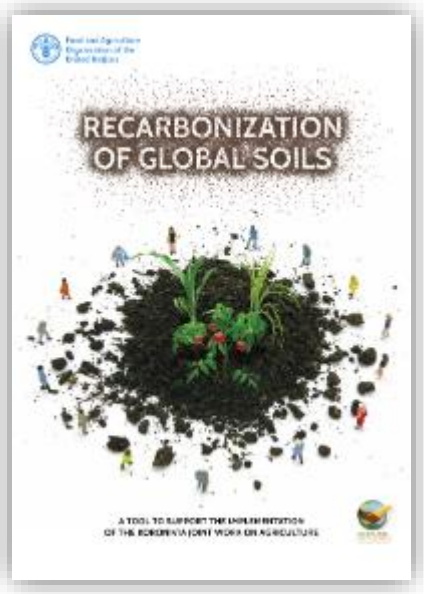
Presentations

- Unlocking the potential of soil organic carbon – Ms Rosa Cuevas Corona (GSP Secretariat)
- RECSOIL: Recarbonization of global soils (agricultural) – Mr Ronald Vargas (GSP Secretary)
- The role of soil organic carbon as a nature-based solution and global gaps – Prof Pete Smith (University of Aberdeen)

Meeting recording

- Link

Publication



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