AgriClimate Workshop

COWI

Track 2: Soils and Land

The track will be moderated by Luca Montanarella of the EU Joint Research Center (JRC), and include a showcase presentation by France (room 166).

The Soil and Land Management track is intended to initiate a deeper discussion on how EU and its member states can jointly promote sustainable, cost-effective, and cross-state flexible soil and land management strategies that can foster GHG mitigation as well as growth, jobs, and environmental benefits. The Soil and Land Management track will consist of two breakout sessions, both of which will be conducted under Chatham House rules, meaning no one will be cited directly or mentioned for their expressed views outside of the session room. In the last of the two sessions, participants will be invited to generate 2-3 concrete policy ideas for GHG mitigation in soils.

Managing soils for climate change mitigation

Land management, in this context, is understood as practices, which enhance the desired use of the land[i]. Soil management is the part of land management, which focus on practices that enhances soil quality for the preferred land use[ii]. The agricultural sector in the EU is one of the most important land and soil managers, as it manages over 40% of the land area, including both farmland and semi-natural areas[iii]. The choice of land use and land management practices by farmers is thus decisive for the change of the carbon stocks on each plot of land. Soil and land management in this paper and at the workshop excludes manure management, liming and fertilizer. From a climate change mitigation point of view, soils are important, as there is around 75 billion tonnes of carbon stored in the soil in the EU[iv]. For comparison, the total amount of carbon emitted by the EU in 2015 was around 1.2 billion tonnes[v]. In recent years there has been an increasing focus not only on preserving soil carbon stocks but also on actively increasing them through farming practices. The international 4 per 1000 initiative launched by France at COP21, for instance, aims to promote carbon sequestration in soils.

Of the total agricultural and LULUCF sector GHG emissions in the EU, 37% stem from soils under agricultural management. In the LULUCF sector in the EU, croplands is the largest emitter of GHGs, however the intensity per hectare is much higher for drained wetlands used for grazing or crops. Peatlands are especially important carbon pools, as they store 20-25% of soil carbon, despite only covering 7% of the surface area, and mostly in a limited number of north and north-western MS[vi]. Given the differences in carbon dynamics and the intensity in use in mineral vs. organic soils, any GHG mitigation strategy could benefit from distinguishing between these soil types. This could entail different tools and measures adapted to mineral vs. organic soils. At the same time, any effort to promote the development and scaling-up of mitigation technologies and practices in soils and land-use must account the multiple purposes of the agricultural sector, including food production, economic growth, improved water quality, as well as the need for flexibility across member states in general.

Questions:

- Is it a feasible way forward to distinguish between soil types when developing policy measures in the future? What are the pros and cons of this approach?
- Given their vast area, **mineral soils** hold a significant carbon stock even if the carbon density is low. How do we deal with that from a MRV and regulatory point of view?
- **Organic soils** can be very productive, but many of them are drained leading to high levels of GHG emissions from oxidation of humus. Given that these are geographically concentrated both within the landscape and in the EU, *how could cost effective, targeted policies and actions avoid complicating lives of farmers or MS with little or no organic soils?*

Key policies and regulation

The state of EU soils are deteriorating, and in many cases associated with loss of soil carbon, a precursor to CO_2[vii]. Consequently, actions to improve the state of soils are relevant in the context of GHG mitigation.

Key EU **soil and land** policies relating to climate change include:

- Soil Thematic Strategy
- Common Agricultural Policy
- LULUCF Regulation and decision
- Other relevant EU policies includes Renewable Energy Directive (RED II), EU Forest Strategy, the Habitat and Birds directives, the Organic Farming framework, the fertilizer regulation and possibly LIFE+ projects. These policies could support action to promote GHG mitigation.

A number of policies, most notably the Common Agricultural Policy (the CAP), addresses the soil carbon pool. Several instruments under the CAP effects land and soil management – also in terms of mitigation of climate change impacts. The instruments include cross-compliance standards of Good Agricultural and Environmental Condition, green direct payments on EFAs, and rural development measures (e.g. agri-environmental and climate measures). Agri-environment-climate measures (M10) under the RDP are also key measures in addressing climate change on agricultural land. However, only a few MS have programmed measures with an explicit focus on climate change mitigation in soils. Furthermore, the Fertilizer Regulation also has impact on the carbon content of soils.

The recent proposal under EU's 2030 Climate and Energy Framework for a new Effort Sharing Regulation (ESR) and proposal on GHG emissions and removals from LULUCF are also relevant. Both could become key pieces in promoting and incentivising GHG mitigation in land management in the EU. When implemented, **the LULUCF Regulation** will require MS to include LULUCF sector emissions and removals in GHG accounts for 2030 emission reduction targets. The rules for doing so adds to those specified in the LULUCF decision from 2012 (EC/529/2012) and entails that emissions from one land use can be compensated by an equivalent removal of CO_2 from the atmosphere obtained for another land use the sector. This must be done before any net removals can be used to compensate emission outside the LULUCF sector, and hence constitutes the so called "no debit rule". Further, the rules impose a cap on use of credits from management of forests and afforestation for compensation. This cap may have implications for the incentive to mitigate in the forest sector, but serves to minimize the risk of crowding out efforts in in agricultural land. All in all, the LULUCF legislation will create incentives for MS to mitigate climate change in the land sector, but does not provide instruments and measures to do so (apart from the flexibility mechanism)[viii].

Finally, European soils are also addressed by the **Soil Thematic Strategy** from 2012, but this is not legislation. The Soil Thematic Strategy has four pillars of possible action to address the concerns on the state of European soils, including continued soil degradation and widespread soil sealing[ix].

Guiding questions:

- If further action was to be promoted using the above policies, do you envision that economic, regulatory, technical or information action is most realistic?; most cost effective?; best suited?
- Do you consider that EU level, MS level, Sub-national, or farm level incentives are most cost effective, feasible, desired?

Opportunities for the promotion of GHG mitigation in Land Management

The increasing focus on the mitigation potential of soils and land management, as well as the absence of specific soil legislation and instruments in the LULUCF legislation, constitute a starting point for developing ideas about policy measures to promote GHG mitigation in land management. We have identified three topics of interest relevant for the GHG mitigation in land management:

1. Optimizing land use and land management

There are several opportunities and practices within agricultural soil and land management for mitigating climate change. Some practices are related to farm management and cultivation practices e.g. precision farming, better grass- and cropland management, reduced/zero tillage, improved crop rotations and biological N fixation in rotations, increased use of cover/catch crops, improved fertilizer application, nitrification inhibitors, and integration of crop residues back into the soil. Other practices concerns farmland vegetation such as management of existing hedgerows, woody buffer strips and farmland trees, restoration of degraded land and re-vegetation. Lastly, other practices focus on the type of land use e.g. wet-/peatland conservation and restoration, and conversion of arable land to productive and permanent grassland as an input to the bio-economy but also to sequester carbon in the soil or grassland for nature purpose. No single mitigation option will be sufficient in itself to reach the full climate change mitigation potential from land. Some mitigation activities are exhaustible and can reach a saturation point, e.g. carbon capture in the soil[x]. Practices should be adapted to the local conditions, as not all practices will be suitable or feasible in all locations, and results will be better if practices are tailored to the local barriers and opportunities. While many improvements will come with capital costs and risks for the individual farmer, many of them will also have positive effect on production in the long run. The reduction opportunities and related cost will vary between MS.

2. Opportunities in technology and data

Drones, Remote Sensing, Internet of Things, Big data, growing scientific knowledge of economic, behavioural and biogeochemical processes may offer opportunities for entirely new ways of monitoring GHG emissions and removals at unprecedented level of detail and perhaps with reduced uncertainty and increasing precision. With higher detail and lower uncertainty, policy makers can better understand the problems they try to address and tailor-make interventions and incentive schemes, including at farm level. Concepts like Results Based Payments, Natural Capital Accounting and Payments for Ecosystem Services may only then realize their perceived potential as part of a holistic approach to future regulation of the land sector.

3. Behavioural change

The choices made by consumers and their habits and preferences are essential for the agricultural sector. The willingness of consumers to pay a price premium for certified or organic products, their preferences for animal welfare or low impact farming, and the degree to which products or product categories are consumed within the EU or exported are important levers for change in agricultural production systems much exposed to global world markets and competition. None of the mentioned EU policies on soil and land addresses the consumers, and few EU policies do. The idea of a Common Food Policy has been floated, but many other ways to change behaviour could be considered.

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Guiding questions:

- What characterizes useful and appropriate tools for climate change mitigation in soil and land management?
- What are, in your view, the most promising tools for climate change mitigation in soil and land management?
- What are the most important barriers for improving soil management and avoid loss of soil carbon in the EU – taking into consideration the huge variety of soils and climatic conditions?

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[i] FAO (2017) http://www.fao.org/soils-portal/soil-management/en/

[ii] Ibid

[iii] Allen B & Maréchal A (2017) Agriculture GHG emissions: determining the potential contribution to the Effort Sharing Regulation. Report prepared for Transport and Environment. Institute for European Environmental Policy, London.

[iv] EEA (2017a) https://www.eea.europa.eu/themes/soil/climate/soil-and-climate-change

[v] EEA (2017a) https://www.eea.europa.eu/themes/soil/climate/soil-and-climate-change

- UNFCCC (2017) Greenhouse Gas Inventory Data - Detailed data by Party, available at http://di.unfccc.int/detailed_data_by_party

[vi] EC (European Commission) (2017a) http://ec.europa.eu/environment/soil/som_en.htm

[vii] EEA (2017a) https://www.eea.europa.eu/themes/soil/climate/soil-and-climate-change

- EEA (2017b) https://www.eea.europa.eu/soer-2015/synthesis/report/3-naturalcapital

[viii] EC (European Commission) (2017b) https://ec.europa.eu/clima/policies/forests/lulucf_en

- EC (European Commission) (2017c) https://ec.europa.eu/clima/policies/forests_en

[ix] EU (European Commission) (2017d) http://ec.europa.eu/environment/soil/three_en.htm

- EC (European Commission) (2017e) http://ec.europa.eu/environment/soil/index_en.htm

[x] IEEP (2017) Research for AGRI Committee - The Consequences of Climate Change for EU Agriculture. Follow-up to the COP21 - UN Paris Climate Change Conference, Directorate-General for Internal Policies, Policy Department B: Structural and Cohesion Policies, Agriculture and Rural Development, European Union 2017.