



THE KEY ROLE OF THE AGRICULTURE AND FORESTRY SECTORS IN GREENHOUSE GAS EMISSION REDUCTION: STEPS TOWARDS BETTER KNOWLEDGE AND PRACTICE.



Nutrient-rich organic soils managed under drainage are one of the largest key sources of greenhouse gas (GHG) emissions from the Agriculture and Land Use, Land Use Change and Forestry (LULUCF) sectors, in boreal and temperate cool and moist (TCM) climate regions in Europe. However, the amount of data available on actual GHG emissions from variously managed nutrient rich organic soils is not sufficient. The LIFE OrgBalt “Demonstration of climate change mitigation potential of nutrients rich organic soils in Baltic States and Finland” project, aims to improve GHG inventories by elaborating specific emission factors for these areas and to contribute to scientifically sound approaches in land use, so to provide policy makers and land owners with scientifically based data and modelling tools for climate friendly land management practices.



According to the 2018 special report of the European Court of Auditors, the quality of EU greenhouse gas inventories is satisfactory, however better insight is needed into future GHG emission reductions especially for the Land Use, Land-Use Change and Forestry (LULUCF) sector that is particularly relevant to EU’s 2030 climate targets. The key role of the LULUCF sector has been highlighted also in the EU LULUCF Regulation, according to which Member States have to ensure that the total GHG emissions accounted in the LULUCF sector are offset by an equivalent amount of accounted CO2 removals. The LIFE OrgBalt project builds up on European regulations and on the analysis of current GHG activity data and reporting methods, to improve GHG inventories and projections and provide GHG modelling tools as a scientific base for planning national policies and emission reduction measures.

EU’S COMMITMENT TO THE REDUCTION OF GREENHOUSE GAS EMISSIONS

According to the Special report 18/2019 “...EU greenhouse gas

emissions: Well reported, but better insight needed into future reductions...” of the European Court of Auditor, EU GHG emissions data is reported in line with international requirements and inventories of emissions have improved over time. However, according to the auditors, further research is needed in specific sectors such as agriculture and forestry. The relevance of the LULUCF sector is not limited to EU GHG emissions 2030 targets, but is also linked to the high statistical uncertainty of LULUCF data.

Human activities increase the concentration of greenhouse gases in the atmosphere. Greenhouse gases absorb and release heat causing the rise of global temperature and subsequently climate change, forcing extreme weather events (droughts, floods, and storms), sea level rise, and a range of other impacts e.g. on biodiversity. This threat has been taken seriously by the EU and its Member States who join the global challenge to reduce greenhouse gas emissions, also in compliance with the Kyoto Protocol

(1997) and the Paris Agreement (2015), aiming for a reduction in GHG emissions (compared to 1990) of 20 % by 2020, 40 % by 2030 and between -80%, up to net zero emissions by 2050. Member States’ contribution to these targets is based both on reductions of GHG emissions from human activity and on removals (“enhancement of carbon sinks”) of GHGs from the atmosphere. The availability of accurate information about emission levels, projections and existing policies is fundamental in striving to reduce GHG emissions.

THE CENTRAL ROLE OF THE AGRICULTURE AND LULUCF SECTORS

The agriculture and LULUCF sectors play a central role in the climate change context. On the one hand, land use contributes to climate change by releasing GHGs in the atmosphere, while on the other, the land sector is an important carbon sink. Plants can absorb and retain carbon dioxide (CO2) from the atmosphere through photosynthesis and soils can store large quantities of carbon. However, when plants die and decompose or are used for short-lived products or fuel, or when soils are disturbed, their storage capacity decreases and CO2 is





emitted. Climate-smart land management plays therefore a significant role in reducing emissions, increasing removals, and enhancing soils' storage capacity.

The "Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework", addresses the LULUCF sector, following the 2014 agreement between the EU leaders based on which all sectors should contribute to the GHG emission reduction objectives, including the LULUCF. According to the regulation, Member States have to ensure that the total GHG emissions accounted in the LULUCF sector according to the accounting rules set by the regulation are offset by an equivalent amount of accounted CO₂ removals from the atmosphere and therefore do not generate net accounted emissions for the period 2021-2030. GHG projections and modelling tools are fundamental in providing accurate information and a scientific base for policy planning and for the implementation of climate change mitigation measures.

IMPROVING GHG REPORTING DATA AND PROVIDING MODELING TOOLS: THE LIFE ORGBALT PROJECT

The LIFE OrgBalt project in line with EU regulations aims to improve the GHG reporting data (activity data and emission factors) for nutrient-rich organic soils under conventional and drainage based management. Furthermore, the project aims to identify and to demonstrate sustainable, resilient, and cost-effective climate change mitigation measures applicable in nutrient-rich organic soils and to provide tools and guidance for the elaboration, implementation, and verification of the results of climate change mitigation policies.

"The most important added value of the OrgBalt project" - said Kristīne Sirmā, Head of the Sustainable Agriculture Development Division of the Ministry of Agriculture of Latvia, partner of the LIFE OrgBalt project – "is the opportunity for policy makers to draw upon the project scientific and international knowledge base. We could question if GHG emission data and projections are relevant for the society. The answer is yes, it is indeed relevant because accurate policy decisions can't be made without accurate data, and policies eventually impact us all". Referring to the international dimension of the project, Kristīne Sirmā added: "The international dimension of the project allows us to test the project outcomes in five EU Member States with high organic soils proportion and has therefore a high importance in enhancing networking opportunities and for the replicability of the project results".

Managed nutrient-rich organic soils are one of the largest key sources of GHG emissions in Boreal and Temperate cool and moist (TCM) climate regions in Europe. According to the "Report on the identified climate change mitigation targeted management practices on organic soils" developed within the LIFE OrgBalt project, the total area of organic soils in the EU is 34.5 mill. ha (7% of the EU area). The project targets the most common group of managed organic soils in the EU – nutrient-rich drained soils in the TCM climate zone, totaling about 21 mill. ha (Harmonized World Soil Database v 1.2) or 61% of organic soils in the EU. These figures prove the relevance of the project in providing significant data and modelling tools to fulfill EU requirements and national GHG inventories' obligations, and the importance to make low emission management on organic soils, and especially nutrient-rich organic soils, a key priority in national climate policies. Moreover, the project territory represents about 65% of the EU area and 45% of the organic soils in EU, providing excellent opportunity to replicate the project results outside the participating countries – in the whole TCM climate zone. The project involves five partner countries - Estonia, Finland, Germany, Latvia, and Lithuania.

INTERESTING FACTS

- The total area of managed organic soils in EU is 34.5 mill. ha (7% of the EU area).
- GHG emissions from organic soils in the project countries is 80 mill. tons CO₂ eq./year (61% of GHG emissions from organic soils in EU).
- The share of organic soil emissions in the project countries varies from 5% of the net GHG emissions including LULUCF in Germany to 59% in Latvia.
- Managed nutrient rich organic soils are one of the largest key sources of GHG emissions in boreal and TCM climate regions in Europe.
- In the agricultural sector in Europe organic soils/drained peatlands make only 3 % of the total agricultural area, but are responsible for 25% of all agricultural GHG emissions.
- LAND USE, LAND USE CHANGE AND FORESTRY (LULUCF) SECTOR POTENTIAL IMPORTANT CONTRIBUTION TO CLIMATE CHANGE MITIGATION, IS NOT YET FULLY EXPLORED.

"One of the main challenges we face is to constantly improve and develop high-quality national GHG inventory according to the Intergovernmental Panel on Climate Change (IPCC) guidelines' five basic indicators – transparency, completeness, consistency, comparability, and accuracy." – added Kristīne Sirmā – "For the Ministry of Agriculture of Latvia being a partner in the LIFE OrgBalt project has a high value because only through the close collaboration among partners and stakeholders, in particularly farmers and foresters, we will overcome all challenges and we will turn them into strengths, in particularly regarding sustainable resource management, especially in land management planning".





About 20 demo and reference sites are planned to be established in the Baltic States and Finland, including new demo sites in Latvia which will have a significant importance being in the center of the Baltic States and covering climate conditions characteristic for the whole region. GHG fluxes will be monitored in 67 sites providing comprehensive data for the whole area of the Baltic States comparable with data sets available in Finland and Germany.

“During the initial phase of the project” – said Ieva Līcīte, project manager and scientific assistant at the Latvian State Forest Research Institute “Silava”, leading partner of the LIFE OrgBalt project – “we completed a thorough analysis of the current situation concerning organic soil data and GHG emission reporting in GHG inventories of the Baltic States and Finland, and summarized the results in the “Report on current situation – applied emission factors and projections of greenhouse gas emissions from organic soils”, available on the project homepage. The status quo analysis allowed us to identify the top target areas for the further work within the project – mainly the need to increase the accuracy of GHG inventories by the implementation of more elaborated methods that incorporate country-specific information, e.g. emission factors. The work on the development of emission factors will be based on GHG measurement data collection in the Baltic States and Finland during the next couple of years of the project run, but GHG inventory improvement work is focused also on the elaboration of the use of activity data sets for GHG calculations. In this regard the main emphasis is on spatial data analysis methods to be used in processing and modeling of existing organic soil data. For this work a specific OrgBalt expert group has been established and is working to come up with proposals for elaborated methodologies by the end of 2020”.

THE LIFE ORGBALT PROJECT: EXPECTED RESULTS

LIFE OrgBalt focuses on exploring and demonstrating the potential of GHG emission reduction and carbon sequestration in nutrient rich organic soil management, as well as developing a

framework for the assessment and the implementation of climate change mitigation measures. It also contributes to scientifically sound approach in land-use and climate policy planning documents, in the Baltic States, Finland and Germany. The LIFE OrgBalt project runs for four years, from 1st August 2019 to 31st August 2023 and aims to: improve activity data and GHG emission factors; establish demonstration sites in the Baltic States and Finland to demonstrate

climate change mitigation measures in croplands, grasslands and forest lands; stimulate climate-friendly and economically based management of nutrient-rich organic soils; create tools (e.g. simulation model for modelling socio-economic and climate impacts of climate change mitigation measures) and proposals for incorporating the identified measures into agricultural, forestry and climate policy planning documents.

LIFE OrgBalt team



Pictures by Ainārs Gaidis

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