

Soil as part of climate solution - agricultural policy reform to promote climate-smart agriculture

As part of Finland's goal of being carbon neutral in 2035, also agriculture must reduce its greenhouse gas (GHG) emissions. About half of agricultural GHG emissions is caused by the cultivation of peat soils. Hence, the largest and quickest emission reductions are possible by changes in the agricultural practices on peat soils. Furthermore, croplands on mineral soils can be converted from emission sources to carbon sinks by diversifying cultivation methods and, thus, improving soil health.

The Finnish agricultural policy should guide agriculture to take on climate measures on both peat and mineral soils. A sufficiently extensive selection of measures is required so that different farms can choose alternatives suitable for them. The adoption of new methods requires changes in the farmers' thinking, and in their approach to farm management. In order to ensure a fair transition to climate-smart land use, we must know the income effects of the climate measures in different areas and for different production sectors.

Recommendations

- The agricultural policy reform should create incentives for measures which reduce emissions from the soil and sequester carbon in the soil. The national CAP strategic plan should include sufficient incentives to abandon cultivation on peat soils and to restore their hydrology especially when the fields do not produce food, fodder or other crops and have minor importance for biodiversity. It could be possible to pay e.g. a one-time payment or a fixed-term payment to the farmer in exchange for removing the field from agricultural use.
- The incentives should be targeted on areas and means which decrease the environmental load from agriculture and are more acceptable to farmers. These are, for instance, croplands on peat soils in southern Finland, fields having lost their production capacity and cultivation methods improving the fertility of mineral soils.
- The conflicting control mechanisms of agricultural policy should be sorted out and streamlined together. Payments detrimental to the environment should be abandoned gradually and the payment system should be developed to enable climate-smart measures, such as rewetting of peatlands. Payments should encourage farms to co-operate e.g. in biogas production and land consolidation of field parcels.

Agricultural policy is reformed – what about climate measures?

There will be almost no changes in the basic structure of the Common Agricultural Policy (CAP) in the period of 2021-2027. However, reforms presented by the Commission raise ambition particularly on environmental and climate issues. In the future, Member States will implement both mandatory and voluntary environmental measures, and are given more power and responsibility for the practical implementation of the CAP.

The Member States will draw up national CAP strategic plans which describe how they respond to the targets set by the Commission. In December 2020, the Commission gave recommendations for the Member States on drawing up the strategic plans. The Commission prompts Finland to especially consider the carbon storages of forests and peatlands. Measures for carbon sinks should be drawn in the CAP strategic plans during 2021 as well as in the climate plan for the land use sector in preparation.

The national CAP strategic plan should include sufficient incentives for abandoning croplands on peat soils and for restoring them particularly when the fields do not produce food, fodder or other crops and have minor importance for biodiversity. If they cannot be removed from production, the farmers should be encouraged to keep them under permanent vegetation cover, most preferably grass.

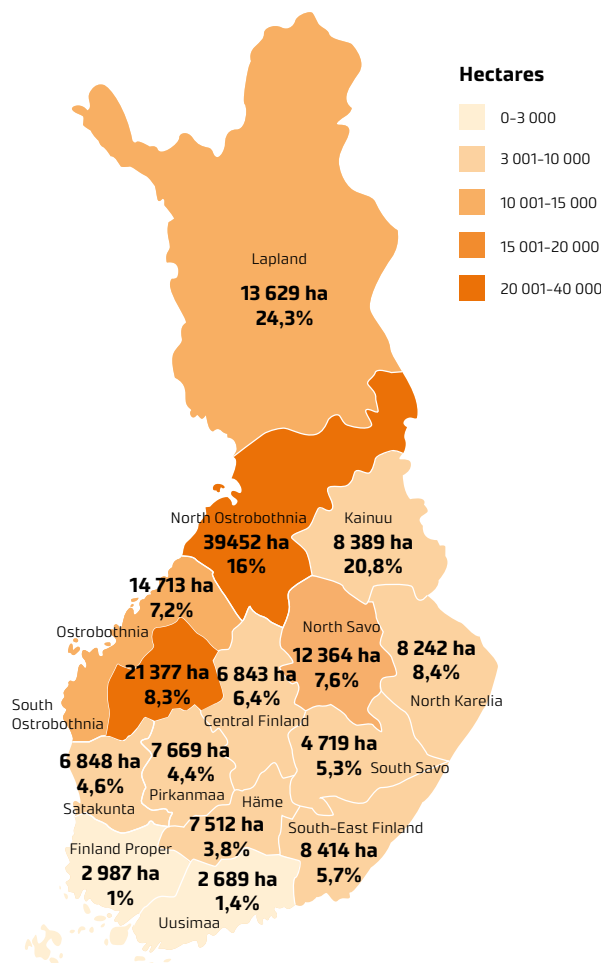
It is justified to target climate funding with socio-economic considerations to the most cost-effective and easy-to-implement measures. The emission reduction measures of peat soils can achieve significant results quickly on even a small area.

In the area of the six most southern Centres for Economic Development, Transport and the Environment (ELY), the share of croplands on peat soils is on average less than 5% and, in the central and eastern parts of the country, on average less than 10%. Therefore, the implementation of the climate measures could be started on peat soils in the southern and central parts of Finland. Emission reduction measures will affect the farms in question, but not significantly the agriculture on these areas as a whole.

Croplands on peat soil – Finnish special feature

The peat layer is a significant carbon stock which creates carbon dioxide and nitrous oxide emissions when peat decomposes due to drainage and cultivation measures. The emissions of croplands on peat soils are reduced by decreasing the share of annual crops, removing plots from production and particularly raising the groundwater level. The most significant emission reductions on croplands on peat soils are provided by afforestation, shift to paludiculture or restoration of the land as close as possible to its natural state.

According to preliminary study results, the raise of the groundwater level brings about significantly greater emission reductions compared with using biochar, catch crop or no-tillage cultivation (SOMPA project). The effects of raising the groundwater level and paludiculture on the farmer's finances have also been studied (RATU project). The current payment system promotes keeping the field as a nature management field instead of e.g. a yield-giving reed canary grass field with high groundwater. Many croplands on peat soil have poor drainage, and their utilisation in producing hygrophytes for e.g. bedding materials or growth mediums can offer new possibilities for cultivation.



Cultivated deep peat soils (peat layer 60 cm or more) and their share of total cultivation area by ELY Centres. Source: Kekkonen et al. 2019.

Incentives for emission reductions and carbon sequestration

The current payment system encourages keeping even underproductive fields in cultivation. In Finland, there is the total of 13,000 ha of croplands on peat soil which has not produced food or fodder in the past 10 years. Drainage on these lands has often weakened and they are many times kept as e.g. environmental fallow grass for which agri-environmental payments are paid. Furthermore, Finland has about 70,000 ha of croplands on peat soils which have been abandoned and removed from production but which still create emissions. These are the primal targets of the emission reduction measures.

Various measures and alternatives should be offered to peat soils so that different farms can find suitable ones, which encourage to conserve the peat layer. If a farmer is willing to shift to paludiculture, the payment system should promote keeping the groundwater level high. For example, there could be a payment for climate wetland from which the farmer could receive an annual maintenance fee.

In Finland, 89% of agricultural area is mineral soils. There, the most important measures promoting carbon sequestration are diversification of crop rotation, increase in catch crop area, other vegetation cover and green fertilizing grasses as well as the use of organic nutrients and soil improvers. Further multi-benefit measures are productivity-increasing investments in field drainage and soil structure, the conversion of less productive fields to biodiversity and pollinator areas, and afforestation.

Carbon sequestration also improves soil fertility, which is an incentive as it increases yield and crop security. However, it should be considered that field plots are unique and carbon farming appears in different form on different plots.

In the long run, there is a need to develop novel incentives to ensure the increase and preservation of carbon storage on mineral soils. The piloting of result-based payments should be included in the new CAP and it should make use of the verification and monitoring systems currently under development.

The payment system should also be an incentive for farmers to promote carbon sequestration on mineral soils and to maintain good soil fertility.

Suggestions for Finland's CAP measures in soil managing cultivation and reducing soil emissions

- Stricter conditions for receiving payments: minimum protection of peat soils, vegetation cover, diverse crop rotation on mineral soils
- Incentive to proper green vegetation cover (eco-scheme)
- Payment for restoring peatlands which have been abandoned and removed from cultivation
- Agri-environmental commitments and investment support: peatland restoration, drainage, improving soil structure, paludiculture, establishing wetlands

Legitimate expectations and protection of property

In Finland, there has been indirect support for clearing peatlands for new fields. Cattle breeders might need new fields e.g. because their environmental permit requires a specific area for manure spreading. There would be no need for clearing new fields if buying or renting fields would be easier.

From the viewpoint of legitimate expectations, a landowner can be considered having a right to expect that cultivating peat soils is allowed. Deciding on the use of the field is within the scope of protection of property.

Changing the agricultural payment system to include climate targets does not infringe the rights of a landowner. Payment systems are fixed-term and they can include incentives the society wishes to include. The protection of property is not infringed if the payments for emission-creating peatland cultivation are abandoned gradually and the focus is shifted to supporting measures which reduce emissions.



Photo: Sanna Söderlund.

Final solutions in the hands of farmers

A part of measures sequestering carbon to the soil or reducing emissions to the atmosphere can be controlled by the means of national CAP implementation, a part needs control from the market or changes in the conventional cultivation methods. New methods can require changes in the farmers' thinking and modes of operation and tolerance of uncertainty because improving the soil health can in the beginning require more inputs than it produces outputs.

Many research projects (SOMPA, Just food, MULTA, OPAL-Life, RATU, Turvepäästö) studied the farmers' thoughts on and attitudes towards climate issues. It is important to recognise the farmers' concerns and seek fair climate solutions for those cultivating mineral and peatlands.

In farmers' opinion, measures that improve and maintain good soil health are important and they are also readily implemented. Farmers are largely supportive of measures aiming at reducing agricultural climate emissions and understand their own possibilities to influence emission reduction and responsibilities in putting it into practice. However, they are still unsure of the proper measures.

Farmers want practical information and guidance on changing their cultivation methods into ones sequestering carbon or reducing emissions. Additionally, they need economic support for experimenting with new cultivation methods and payments to compensate possible income losses caused by climate measures. The predictability of the payment system is important for planning the future because the farmers' financial situation can be tight.

Farmers emphasise that the effects of climate measures on farmers in different areas must be considered when designing policy measures. In some areas, the clearing of new field plots is the only possibility for increasing cultivated area. In these areas, restrictions on peatland cultivation cause farmers some concerns which can be made easier by co-operation between farms and reallocation of field parcels.

This co-operation can be the exchange and recycling of plots or common crop rotations between farms. In areas dominated by peat soils and cattle, this does not always bring emission reductions because peat soils are often already under intensive grass cultivation.

It is the farmers' opinion that the payments from carbon sequestration or emission reductions should be paid outside the agricultural support system. Farmers would rather receive income from producing yield than from just maintaining the fields for farming. Farmers are supportive of emission reduction compensations paid by private persons or companies as long as the payments are directed to measures which are effective and fair from the farmers' viewpoint.

Farmers' suggestions for climate measures

- Economic incentive for improving soil health, e.g. payment paid once in crop rotation for renovation crops.
- Enabling and supporting cultivation measures enhancing carbon sequestration and its stability. For example, agroforestry also increases biodiversity and prevents erosion.
- Directing field payments to active farms; if farm's fields are underused, the focus should be on carbon sequestration and maintaining carbon storages.
- One-time payment for afforestation, rewetting or wetland establishment on fields with poor fertility or poor drainage.
- Maintenance payment for investments contributing to carbon sequestration and emission mitigation, such as controlled drainage.

Good examples

The Setälä-Eerola farm in Hämeenlinna is specialised in beef rearing and crop farming. Farmer **Jari Eerola** joined the Carbon Action project to improve the farm's profitability. However, the participation introduced a greater change as Eerola started to develop the farm completely into a new direction of total reform. The farm's carbon footprint and input-output relation are calculated carefully. The farm produced in co-operation with Altia the first regeneratively cultivated product, **Koskenkorva Climate Action**, and all fields will shift to regenerative agriculture in the next few years. For more information, please see [here](#) (in Finnish).



Photo 1. Farmer Jari Eerola. Photographer Marjo Aspegren.



Photo 2. Farmer Rauno Haapala. Photographer Jari Lindeman.

A peatland located in North Ostrobothnia caused problems for its owner due to very poor crop yields. Farmer **Rauno Haapala** decided to raise the groundwater level and now produces reed canary grass which replaces peat as bedding material and growth medium. He is satisfied with his decision. Please see Haapala's interview [here](#) (in Finnish).

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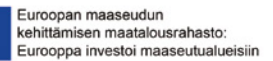
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Projects

Novel soil management practices – key for sustainable bioeconomy and climate change mitigation (SOMPA)
Sustainable, climate-smart and just food system (JUST FOOD)
Multi-benefit solutions to climate-smart agriculture (STN MULTA)
Economically feasible alternatives to management of deep peat soils in agriculture (RATU)
Optimizing agricultural land use to mitigate climate change (OPAL-Life)
Mitigation of environmental load in crop production on peat soils (Turvessästö)
Towards carbon neutral municipalities and regions (CANEMURE)

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