

Agricultural potential in carbon sequestration



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The EU should reduce its net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels, as agreed in the EU Climate Law. On 14 July 2021, the Commission presented proposals to deliver these targets and make the European Green Deal a reality. In the context of the "Fit for 55" package, the Commission will now engage with sectors to prepare specific roadmaps charting their path to climate neutrality.

- 31,7% of total SOC stocks in the EU are found in agricultural soils (9,3% in grassland and 21,4% in cropland).
- 20 to 25% of European SOC is stored in peatlands, even if they cover only 6 % of the EU-27's land area
- Agricultural GHG emissions decreased by 108 Mt CO₂-equivalent from 1990 to 2018, but this reduction occurred until 2005 and the emission rate has remained stable since then.

The study

The main objective of this analysis is to assess the potential of carbon sequestration in agriculture and present policy implications and opportunities for the Common agricultural policy.

To this end, the Commission shall proceed with the quantification of the mitigation potential in agriculture up to 2030, which will include reductions in greenhouse gases emissions (GHG), effects of land use changes and carbon

storage in agricultural soils. An integrated policy framework covering agriculture, forestry, and land use (AFOLU) is proposed from 2030 with the view of achieving carbon neutrality in these sectors by 2035.



Key findings

- Estimates of carbon stocks in the EU-27 soils range from 34 Gt (Gigaton) in the 20 top cm to 75 Gt in the top 30 cm, with uneven geographical distribution (soils of Nordic and Northeastern countries are carbon rich while those of the southern countries are generally carbon depleted). All simulations predict overall increases of the EU soil carbon stocks, as the result of decreasing soil organic carbon (SOC) stocks in Mediterranean countries compensated by SOC accumulation in others, notably Ireland, France and Germany.
- More than 55% of the climate mitigation potential in the EU-27 agricultural sector lies with agricultural soils and manure management.
- Some sustainable agricultural practices are particularly favourable to carbon sequestration in soil (cover crops and catch crops, reduction in tillage, plant diversity).
- The new CAP provides tools for farmers to engage in sustainable practices for carbon sequestration in soil, although efforts in research and knowledge transfer are still needed.

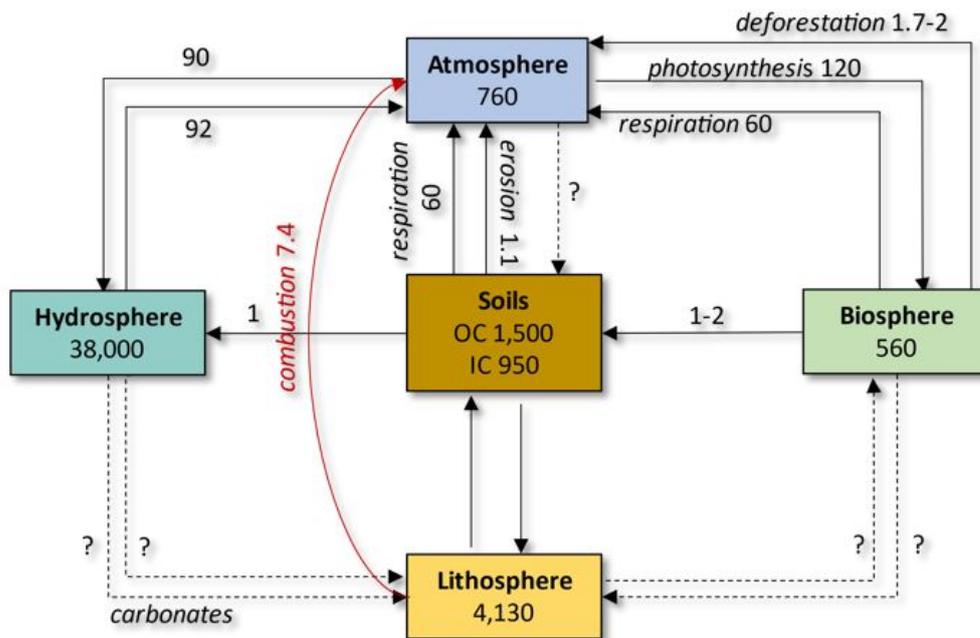


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Policy recommendations

- Achieving further substantial GHG emission reductions in the agricultural sector will require significant changes in farming practices and agricultural policies. Emission intensity of agricultural production can be further reduced if we are able to overcome the barriers that have limited adoption of GHG mitigation measures and innovations.
- Stimulating carbon sequestration in soil is necessary to attain the Green Deal's objectives. In this respect, the rewetting and restoration of peatlands, agroforestry and grasslands are key to preserving and enhancing SOC stocks.
- A reliable evaluation of the effects of management on soil Carbon stocks is essential to settle fair payments for results or to certify carbon credits for markets. Due to significant gaps in the European network of soil data, soil sampling for Carbon analysis is still necessary.
- Result-based schemes should be accompanied by reliable indicators and monitoring, and capacity building including Farm Advisory Services and certified public labs. To reduce Measurement Reporting and Verification (MRV) costs in organic carbon sequestration in soils, a reliable integrated soil survey system will be needed. Increasing the number of long-term experiment sites and the variety of tested management options (e.g. by reinforcing the European living-lab network) is essential.
- If a significant increase in carbon sequestration is to be achieved, large agricultural areas will have to be managed accordingly and the related compensations to farmers may prove unaffordable for public bodies. Complementary actions by private actors, or public private partnerships can help set up carbon markets which could play an important role for carbon sequestration, as exemplified by pilot projects in Europe and abroad.

The carbon cycle. Carbon pools in boxes and fluxes in lines. Numbers indicate the size of carbon pools (in Gt) and fluxes (in Gt y-1). IC: inorganic carbon; OC: organic carbon.



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