THE ROYAL SWEDISH ACADEMY OF AGRICULTURE AND FORESTRY

Additional Feedback: Land use, land use change and forestry - review of EU rules

Specified comments and references to the following questions:

Among the following drivers behind the decline of the land-based net carbon sink, which are the most important in your view:
Natural disturbances: We can today see the effect of climate change (drought, insect damage, storm etc.) and overstocked forests. Therefore, mature managed forests that are at high risk of disturbance will have the greatest climate benefit if harvested and used for substitution of fossil materials and energy.

Deforestation: The area of forests in Europe has increased by 9% over the last 30 years. (FOREST EUROPE, 2020). Although deforestation occurs in some places, the overall trend is that Europe's forests are growing in size.

Increase in wood harvest: The volume of wood and the carbon stored in the biomass of European forests have grown by 50% over the last 30 years. About three-quarters of the net annual wood increment is felled. (FOREST EUROPE, 2020). Thus, the carbon sink is large in the European forests if forests are kept vital. It is important that the forests are sustainably managed.

References:
FOREST EUROPE, 2020: State of Europe's Forests 2020. SoEF_2020.pdf (foresteurope.org)

Gert-Jan Nabuurs, et al. 2013 First signs of carbon sink saturation in European forest. Nature Climate Change volume 3, pages792–796(2013)

Among these potential EU policy approaches to promote climate change mitigation in land-related sectors, which do you think are the most relevant to achieve a higher climate ambition in 2030?
EU datasets and the framework for collecting them need to aim for higher standards of quality and fitness to purpose.

Land-related sectors, agriculture and forest, are to a certain extent promoting climate change mitigation. Thus they have to be regarded as contributing sectors as well and not focused on only as emission sectors. The production from agriculture and forest therefore have to increase in EU and this has the potential of contributing with bio-CCS in many ways, not least when products from fossil sources are instead produced from biological sources. The importance of diets and consumption to promote climate change mitigation is very high but the way to reach it is not through EU policy. Concerning taxes, the possibility for EU to add new taxes is limited.

P O Box 6806 (visit: Drottninggatan 95 B)
SE-113 86 STOCKHOLM
SWEDEN

Telephone: + 46 8 5454 7700
E-mail: akademien@ksla.se
Website: www.ksla.se

SWIFT code: SWEDSESS
IBAN No: SE 208 0000 8327 9993 9618 881

An important function of the land is to supply bio-based and renewable materials (wood, ligno-cellulosic products, bio-plastics, bio-chemicals, etc…) that can substitute fossil-based and non-renewable materials. In addition, the LULUCF rules recognise long-lived wood products (e.g. those used in the construction sector) as a form of temporary carbon storage. What is the best policy approach to harness this substitution effect and carbon storage potential?

From a mitigation perspective it is important to enhance the use of wood in buildings, packing, fibers used for textiles, etc. However, KSLA does not believe that carbon credits and tax incentives are the right way to go. These two incentives create costly and unnecessary administration.

To increase the use of wood, research and training of architects and engineers, among others, are important.

In which areas should the EU focus efforts to enhance carbon sinks and protect carbon stocks?

Grasslands have a potential to serve as one of the largest sinks for carbon (FAO 2010\11b) and should be included in international agreements to reduce greenhouse gas emissions. The widespread cultivation of grasslands has resulted in large losses of SOC and substantial efflux of CO2 into the atmosphere (Lal 2011). Many forests store more of their carbon above the ground while grasslands hold most of their carbon below ground (Mendoza-Ponce & Galicia 2010). Grasslands also have slower decomposition rates of litter compared to forest environments (Ochoa-Hueso et al. 2019). Consequently, the fraction of the total organic matter input that is added to the soil belowground is larger in grasslands than in forests (Mason & Zanner 2005). Grasslands should be considered a more reliable carbon sink than forests in a changing climate with increased risk of forest fires (Dass et al. 2018) especially in northern regions where wintertime albedo (snow) plays an important role.

References:

Dass, P., Houlton, B.Z. Wang, Y. & Warlind, D. 2018. Grasslands may be more reliable carbon sinks than forests in California. Environ.Res.Lett. 13 (7): 074027 https://doi.org/10.1088/1748-9326/aacb39

FAO 2010\11 p 272

Lal, R. 2011. Sequestering carbon in soils of agro-ecosystems. Food policy. Supplement 1. 36:S33-S39 https://doi.org/10.1016/j.foodpol.2010.12.001

Mason, J.A. & C.W. Zanner 2005. Grassland soils. In: Encyclopaedia of Soils in the Environment. Reference Module in Earth Systems and Environmental Sciences Pages 138-145.

Mendoza-Ponce, A. & L. Galicia. 2010. Aboveground and belowground biomass and carbon pools in highland temperate forest landscape in Central Mexico. Forestry: An International Journal of Forest Research, 83(5):497–506, https://doi.org/10.1093/forestry/cpq032

Ochoa-Hueso, R., Delgado-Baquerizo, M., King, P. T. A., Benham, M., Arca, V. & S. A. Power. 2019. Ecosystem type and resource quality are more important

than global change drivers in regulating early stages of litter decomposition. Soil Biol Biochem 129:144-152.

How should more ambitious climate action in land-related sectors be financed?

An EU mechanism for labeling products regarding land-use and forestry would start discussions about regulating other criteria than simply the climate-related. Higher product prices would of course be good, but it is not evident that label mechanisms would lead to higher prices. It would risk setting market forces out of play and risk increasing imports of wood products to the EU from countries with less stringent regulations, i.e. carbon leakage.

Carbon credit systems would create administrative burdens in the entire value-chain. Credibility and transparency are also important issues for such systems to be effective. They would require extensive follow-up systems. In addition, a system for trading in carbon credits would only be credible if it included a clear additionality. If the fossil-based sector were given the opportunity to buy carbon credits instead of addressing its own emissions, it would reduce the impetus for a transformation into a green economy in line with the Green Deal.

In your opinion, should there be more stringent targets for the LULUCF sector?

While the LULUCF sector is important for achieving the EU's climate mitigation goals, KSLA sees a risk that raising the ambitions for this sector could become an excuse for lowering ambitions in other sectors. KSLA is particularly concerned about this due to the complexity of the LULUCF sector where goals for greenhouse gases and the carbon balance need to be considered alongside many other aspects of sustainable land management that recognize the interrelated social, economic and environmental aspects of Agenda 2030's sustainable development goals.

Among these options to reinforce the LULUCF monitoring, reporting and verification (MRV) rules, which are your preferred ones?

The use of wall-to-wall satellite imagery will most likely not contribute to better estimates of carbon stock and changes. A report in Nature (Ceccherini et. al. 2020) argued that in Europe the area of deforestation has risen dramatically within the last two decades and the loss of biomass increased even more. This study was wrong and has been criticized by several experts in the field, due to fundamental errors in the research design (Kohronen 2020). The Swedish Forest Agency and the National Forest Inventory made an official "rebuttal" based on comprehensive field measurements with verified statistics certainties. This rebuttal demonstrated a positive development in both forest extent and stocking of Nordic forests during the period where the Nature article claimed dramatic declines (Paulsson et al. 2020).

References:

Ceccherini, G. et al. Abrupt increase in harvested forest area over Europe after 2015. Nature 583, 72–77 (2020).

Kohronen, K 2020: A new article in the journal Nature overestimates the increase of forest harvesting in Europe (Luonnonvarakeskus (luke.fi)).

Paulsson, J, Claesson, S., Fridman J & Olsson H. SLU News 4 July 2020. Incorrect figures on harvested forests in Nature article

How should the architecture of EU climate policy be designed when it comes to agriculture and land use?

References:

A: DeDeyn, G.B., Cornelissen, J. H. C., Bardgett R.D. 2008. Plant functional traits and soil carbon sequestration in contrasting biomes. Ecology Letters 11:516-531.

B: Ward, S. E. et al. 2016. Legacy effects of grassland management on soil carbon to depth. Global Change Biology, 22, 2929-2938

C: Ward, A.; Dargusch, P.; Thomas, S.; Liu, Y.; Fulton, E.A. 2014. A global estimate of carbon stored in the world's mountain grasslands and shrublands, and the implications for climate policy. Glob. Environ. Change, 28, 14–24.

D: Bonan, G. 2016. Ecological climatology: concepts and applications. 3. Ed. 692 p. Cambridge University Press

In case there were to be a single policy strand covering emissions from the land sector (agriculture, forestry and other land use), should there then be a specific target for this sector?

A specific target for this sector would be a constraint to needed sustainable development. It would be impossible to fulfill if legally binding. Production in agriculture and forestry have to increase and products from these sectors will enable substitution.

Additional feedback:

In the long run, active forestry with high harvest and efficient utilisation of biomass for replacement of carbon-intensive non-wood products and fuels provides significant climate mitigation, (Gustavsson et al 2021). With the present EU focus on carbon sinks there is an obvious risk that the potential mitigation from forestry will be reduced overall and be less efficient where the potential is utilized. The discussion of forest use today is to a large extent focused on energy substitution (bioenergy). The primary goal for most forest owners, relying on income from their woodlands, is to produce sawn wood, which will be used in long-lived products (e.g. houses). There is also a rapid development of bio-based products that substitute for fossil carbon demanding products, such as the fibers used for textiles. Energy in the form of heating, electricity and liquid biofuels are positive by-products from these efforts to find bio-based alternatives.

In the long run, a high carbon sink cannot be maintained if the forests are unmanaged since growth decreases and the carbon losses increase with age. Research found already ten years ago that Europe's forests showed the first signs of carbon saturation (Nabuurs et al 2013). The authors stated that: "countries should be less focused on the forest biomass sink strength and consider a mitigation strategy (adapted to national circumstances) to maximize the sum of all the possible components: carbon sequestration in forest biomass, soil and wood products, and the effects of energy and material substitution of woody biomass". It is important to consider soil organic carbon when carbon sinks are discussed. In

boreal forests ectomycorrhizal fungi acts as agent of N immobilization in N–poor forests. This speaks in favour of using rotational silviculture with planting after clear–felling or natural regeneration under a few seed trees in the N–poor systems (high C/N ratio). The introduction of clear–felling has been followed by very substantial increases in forest growth in Sweden (and Norway and Finland). (Högberg et al. 2021).

Forest policy and management can have many objectives, which vary among regions because of socio–economic circumstances and natural conditions. Such varying socio–economic conditions along with natural variations in climate and soils affect the options for forest policy and management. Regardless of management systems there is a substantial risk that forest damage increases if managed production forests are not regenerated in due time. Production forests are usually managed to have a certain rotation period (although relatively flexible), and therefore have a high risk for increased damage with age. This is obvious for storm damage which increases with age, bark beetle damage which increases with stand volume and age, as well as other forms of damage, such as butt rot, etc. Therefore, thinning in old stands (with high trees) generally implies a higher risk to the carbon sequestration, as well as damage to forests and reductions in their overall climate benefit. Although this is the general picture, some forests, e.g. pine forests on poor soil and oak forests are more tolerant to ageing.
Adaptation of forests to climate change should in many cases imply shorter rotation periods. This makes it possible to change crop (e.g. species) faster than for long rotation periods. Of importance for adaptation is also the potential of using improved seedlings for climate adaptation, growth, and damage resistance.

Incentives for increased sinks in the forest stock in the short run can lead to reductions in forest harvest in the long run, even if more intensive silviculture (with more harvest) might provide the same overall climate mitigation effect.

If harvests are reduced, large economic values will vanish. This will most probably have negative effects on silviculture and will lower the production and vitality of forests. It has also as an effect reduced employment opportunities and lower economic activity primarily in rural areas which must be considered.

KSLA has in other fora argued that it is unreasonable to reckon that the uptake of 1 kg of CO_2 in the circular biological system can compensate for 1 kg CO_2 fossil carbon. Storage of carbon in forests or agricultural land is unsafe (due to e.g., fire, storm, insect damage). This is not accounted for in the EU "LULUCF model". For example, in New Zealand this has been accounted for by a system where 1 kg of fossil fuel CO_2 corresponds to 2 kg CO_2 storage in the forest ecosystem. Similar systems are used in Australia and California, USA.

Better management of soils implies opportunities for both better production and to increase sinks. Research points out a number of activities that can be positive (Bolinder et al 2020). Examples of this are the use of natural grassland, perennial crops, manure applications, crop residue retention and the use of cover crops.

Rules concerning LULUCF should be better adapted to the different conditions between countries, for example how nutrient uptake and growth differs between regions because of carbon in the forest soil (Högberg et al 2021). The national

forest plans should also be consistent with the objective of contributing to the conservation of biodiversity and the sustainable use of natural resources.

The future use of BECCS and BECCU are also important components when considering the European policy concerning LULUCF. If the LULUCF regulation effects forest and agricultural production this will reduce possibilities for BECCS and BECCU.

References:

Gustavsson et al Renewable and Sustainable Energy Reviews, Volume 136, February 2021)

Bolinder, MA, et al. 2020. Mitig Adapt Strateg Glob Change 25, 929–952.

Högberg P et al 2021. Forest Ecology and Management, in press