

Measuring climate impact of forests management—a groundbreaking approach

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A JRC-led group of forestry research experts has developed a rigorous new fact-based carbon accounting system that reflects how forest management practices can help mitigate greenhouse gas (GHG) emissions.

This new system has been recently adopted by the EU as the scientific basis for integrating the land-use, land-use change and forestry (LULUCF) sector in its climate strategy.

Forests can play a big role in mitigating greenhouse gases

While they are growing, trees absorb carbon dioxide from the atmosphere through photosynthesis and store it as carbon in their wood.

Through proper [forest](#) management, trees acting as "carbon sinks" can have a significant impact on carbon reduction.

Conversely, deforestation can make them "carbon sources", exacerbating global warming.

Therefore, [sustainable forest management](#) can help mitigate GHG emissions.

Under the Paris Climate Agreement of 2015, the EU has pledged to cut

GHG emissions by at least 40% by 2030.

EU forests absorb the equivalent of nearly 10% of all EU GHG emissions each year.

Conserving and enhancing this sink, while using wood products as substitutes for more carbon-intensive energy and materials, could play an important role in reaching this target.

However, credibly measuring and reporting on the effect of forest management on emission reductions (or absorption increases) has proven to be difficult.

The use of projected 'forest reference levels', as implemented under the Kyoto Protocol (2013-2020), is controversial as it includes the assumed (and therefore unverifiable) effect of future policy impacts, which can lead to counterfactual scenarios that include inflated future harvest figures or fail to account for future increased emissions.

Calculating GHG mitigation by forests based on factual evidence rather than forecasts

The new science-based approach for credible accounting of mitigation in managed forests described in a recent article sets reference levels based on documented historical forest management practices rather than on projected future policy impacts.

In other words, it is based on factual evidence (what has actually happened) rather than projected future outcomes (which may never materialise).

Applied to 26 EU Member States using the Canadian Forest Service's

Carbon Budget Model, it found that forests actually absorbed more carbon dioxide in the years 2013-16 than was accounted for under the current Kyoto Protocol method.

This was because the [emission](#) forecasts were based on projected increases in forest harvesting that never actually occurred.

Based on the new system, EU forest harvest levels are expected to increase by 12% by 2030, but at a slower rate than in forecasts based on the Kyoto Protocol method.

This is because the system takes age-related dynamics into account but disregards future (unrealised and unverifiable) impacts of policy on harvest volumes.

The new approach leaves countries free to manage forests as they wish, but requires that the atmospheric impact of changes in management relative to an historical period are fully reflected in the accounts.

This ensures the comparability of forest accounting with other sectors, such as the energy sector.

This offers a credible solution to the debate on how to account for forest sinks at the country level, and helps improve transparency and scientific credibility within the Paris Agreement.

Involving land use and forestry in reducing GHG emissions

A new EU Regulation on Land Use, Land Use Change and Forestry (LULUCF) published on 19 June 2018 involves, for the first time, the LULUCF sector in cutting GHG emissions.

The Regulation sets out the commitments and rules for the inclusion of GHG emissions and removals from the LULUCF sector in the framework of the EU's 2030 climate and energy targets.

According to the new Regulation, Member States may use certain mitigation actions in forestry and agricultural land uses to meet their climate targets.

This is in line with the Paris Agreement, which points to the critical role of the LULUCF sector in reaching long-term climate mitigation objectives.

The JRC contributed significantly to this legislative proposal, both during its design and the discussions with Member States and the European Parliament.

In particular, the JRC was heavily involved in the most complex and debated issue in the entire legislation—the rules on how to account for the climate impact of [forest management](#).

A recently published Technical Guidance for implementing the forest reference levels, coordinated by IIASA, extends and further elaborates the scientific principles outlined in the JRC work.

More information: Giacomo Grassi et al, Science-based approach for credible accounting of mitigation in managed forests, *Carbon Balance and Management* (2018). [DOI: 10.1186/s13021-018-0096-2](https://doi.org/10.1186/s13021-018-0096-2)

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