Climate benefits from forests, forestry and forest industry – how can we clarify, calculate and communicate them?

Report from a roundtable discussion
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Contents

Key messages

1. Current official climate reporting gives a skewed perspective on the role and opportunities of forestry and forest products as the LULUCF methodology emphasizes forest carbon storage and leaves aside GHG savings associated with forest products;
2. The forestry reporting model proposed by SCA provides a clear and more complete picture of the interactions between forestry and the global climate as it considers forest carbon storage, production emissions and substitution effects of forest products. Hence, benefits from both active forest management for increased raw material supply, as well as efficiency enhancements in the value chain are in focus;
3. Considerable and persistent engagement, with interest groups, policy makers and the wider public, is needed, particularly on European level, for establishing a more complete understanding of the role and potential of forests and forestry for the global climate;
4. The proposed forestry reporting model should be further scrutinized by the research community and also promoted for wider use among forestry corporations, especially those active in countries (Sweden, Finland) or regions with a strong tradition of forest management and forest industries.

Introduction

This paper is the result of a roundtable discussion between ten experts from different segments of the Swedish forestry sector and academia. It was initiated by SCA, a forest industry corporation, with the general intent of bringing results from SCAs new climate impact reporting to a wider audience of stakeholders, seeking input to further improve methodology for forest-climate reporting, and providing input to political processes dealing with forests and climate change.

The roundtable participants first met on 25 February 2019 and have jointly prepared this paper under the Chatham House rule.

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Background and purpose

Forests have a key role in society's efforts to curb global warming. While there is consensus on this, there is often political or academic disagreement on the best approaches for achieving climate benefits from forests. Views range from leaving forests to grow wild so as to maximize short-term carbon storage, to using all available means to maximize biological growth and forest industry production. The differing views are, of course, influenced by other goal orientations, such as maximizing biological diversity or financial returns. Our conclusion on this confusion – and starting point for this paper – is that we lack a holistic model of how forests, forest management and forest industry as a whole interact with the global climate. Such a model is needed for fact-based evaluations of priorities and opportunities in the sector.

A specific concern is that the sector boundaries and methodologies developed in the intergovernmental processes, including UNFCCC, IPCC, and the Kyoto Protocol, confine the "forest sector" to the "Land Use, Land Use Change and Forestry" (LULUCF) context. The LULUCF reporting methodology focuses on the stock (pool) of carbon in the forest and forest products. As a result, there is a strong policy focus on carbon storage in forests and less attention to dynamic improvements of carbon up-take in the forest and GHG savings

associated with forest-based products, including bioenergy. The bureaucracy and detailed regulations established around the proprietary LULUCF approach, inhibits comprehensive considerations of the forest sector. Further, there is a lack of harmony between the LULUCF construction and policies that aim to increase the production and use of bioenergy. We believe the omission of a complete forestry sector analysis can lead to counter-productive or confusing policies and seriously limit possibilities for meeting fundamental commitments in the Paris climate agreement.

We are also concerned over the short time frames for emissions reductions that have become established under the climate regime, for example in national targets, such as the Swedish net-zero emissions by 2045, or the European Union's 2030 Energy Strategy. In forestry, much longer time horizons are in play for improving forest productivity and determining sustainable harvesting levels, particularly in boreal and temperate regions where forests grow relatively slowly. If the shorter time-frames are imposed on the forestry sector, these can lead to decisions to preserve forest carbon stocks in the short term, which can impact the climate regulation potential of the forest over the longer term as well as biomass harvest for various uses.

The purpose of this paper is to develop momentum towards a forestry reporting model that includes a complete description and reporting of carbon flows and climate impact of forests, forest management and forest industry. We build on work done by SCA for its annual report 2018 (SCA, 2019), where the company achieved a total positive climate effect corresponding to 8 $MtCO_2e$ of avoided fossil carbon emissions in 2018, as a co-benefit of a robust financial result for the year. This indicates strong synergies between financial performance and climate change mitigation, which we believe should render considerable attention in climate politics at national, European and global levels. The paper proposes ways forward on scope, methods, context and communication of the forestry reporting model.

SCAs model for reporting climate impact - relevance and applicability

The model that SCA used for its 2018 annual report aims to provide a complete picture of the company's climate impact, at a general level. Detailed background to the model is provided by Holmgren and Kolar (2019). Both authors are also part of the roundtable group and this section should therefore not be read as an independent perspective. During the discussion, the following points were brought forward:

Strong points:

- The simplicity of the model is useful and helps a wider audience in understanding a relatively complex system;
- The system boundary is well defined and allows for aggregation of several companies, or at country level;
- The model documentation effectively brings together, summarizes and uses existing research findings;
- The model well meets the concerns regarding the LULUCF context expressed above by including substitution effects and forest harvest levels. Compared with the LULUCF methodology and focus on carbon storage, the model points to the potential

of active forestry and forest products. The model also emphasizes the development of the forest as a whole whereas the focus in LULUCF can be on isolated "activities" such as harvesting which largely obscures the growth dynamics across the entire forest;

- By including fossil emissions in the value chain, a focus on needs for reducing these is maintained, even though the overall model results are climate positive. Transportation, in particular, remains a major emissions factor that requires attention;

Areas for improvement or in need of attention:

- A stronger focus on the positive growth effects from active forest management, such as improved plant material, soil preparation and fertilization may be helpful, also as this is where the potential for higher substitution effects from products are created. Currently, the model highlights net change of carbon stock in the forest, which comes close to the LULUCF logic where investments in higher growth is not considered. A focus on overall growth is also important as the net change in carbon stock can periodically be negative, which should not uncritically be interpreted as a loss in climate impact provided there is a long term balance. In short, a high and sustainable growth rate is the key factor for overall positive climate impact;
- Risk of double counting in substitution effects, especially for recycled material;
- Forestry companies without own forest or without own industries may not fit well into the current model design, especially as regards the calculation of substitution effects;
- The placement of substitution effects in the model may need some attention. As it stands, it is only the industry that "benefits" from creating substitution effects through their products. There may be a case to emphasize the (potential/future) substitution effects of forest management so as to create more focus and incentive across the entire operations;

General suggestions:

- Counting substitution effects at product level can be technically limiting and miss a focus on the system effect as a whole. An alternative approach could be to account for placement of bio-based carbon in products in absolute numbers as a starting point, and then derive substitution effects from there;
- The model does not have a time dimension and as such does therefore not provide insights in the opportunities and limitations of forest management over the long term. The need to maintain active forest management over time to maintain or increase possible harvest levels is critical for long term success, financially as well as for the climate. The risks and lost opportunities in areas where the growth potential is underutilized, and forest stands overaged (e.g. large parts of Central and Southern Europe) should be highlighted;
- It is not a purpose of the model to go beyond the climate effect of forestry and forest products. For a wider analysis, however, it is essential to put the climate impact in

context with a multitude of other operational goals with high synergy (e.g. financial results and long-term forest management), and those where different levels of trade-offs may be needed (e.g. nature conservation and reindeer management).

Public perception of the forestry sector's positive climate impact

The SCA model was developed for inclusion in the company's annual report SCA (2019). It was therefore from the outset designed with attention to communication requirements to a non-specialist and wider audience, largely representing the general public. The report provides, to the group's knowledge, for the first time specific numbers of the overall climate-positive effect of a forestry corporation. It is not obvious that the wider audiences have previously perceived forest industries as climate-positive – on the contrary many stories in media have conveyed the opposite perspective. One question for the roundtable was therefore how the public perception of the forestry sector's climate impact would be influenced by the new report.

The group had the following comments, noting that the group members are primarily experts in forestry and forest products and not in communication or public engagement.

a) It is important to more widely establish the understanding of the forest as part of a circular system and to emphasize the fundamental difference between biogenic "green" carbon and fossil "black" carbon. When biomass is used for products and energy, carbon is circulated between the atmosphere and the biosphere. In contrast, fossil carbon emissions add new carbon to the atmosphere. With this fundamental distinction established and acknowledged, there are good possibilities that the strong arguments in favor of forestry and forestry products are widely accepted.

b) It is equally important to avoid a narrow debate on the role of forests for the climate that excludes the wider range of products and services provided. Climate benefits will always accrue in combination with, or as a side-effect of, other benefits. A key message with SCAs reporting is to point at synergies between profitable forestry and forest industry operations on one hand, and climate benefits on the other;

c) Similarly, it is necessary to enhance knowledge on how active forest management relates to biological diversity and other critical ecosystem services from the forest. Without a clear and broad understanding of synergies and trade-offs, we may remain in the current polarized debate between conservationists and forest managers. We believe this polarization is unnecessary and that a broader perspective on sustainable forestry can help alleviate the perceived conflict;

d) The simplicity of the SCA model will be very helpful for communicating the wider role and potential of forests and forestry to mitigate global climate change;

e) The model provides an excellent basis for demonstrating to the wider public how active forest management can help mitigate climate change. The Swedish(-Finnish) success of dramatically enhancing forest growth over several decades should be contrasted with the much lower carbon capture in regions where forest management is less ambitious;

f) Recent debates over the climate footprint caused abroad by Swedish citizens (eg due to cattle / cattle feed production in South America) can now be complemented with

an opposite positive influence through exported climate benefits through substitution, given that 80% of forest industry production in Sweden is exported;

g) There is a major communication effort required to establish a common understanding that sustainable forestry can not be equated with large standing volumes/carbon stocks, and that instead that sustainable forestry is based on sustained forest growth over the long term, generating high and varied values;

h) The concept of product substitution is associated with challenges as there is no agreed reporting standard. As a consequence, the limited data available still come with uncertainties and gaps. Further, "substitution" can be perceived as an intangible and fuzzy concept that can be difficult to accept by non-experts. It is possible that the wording "product substitution" should be complemented with more specific and less relativistic concepts in the narratives, such as "biosphere products" or "bio-based products". Strong partnerships across industry, ngos, research and public institutions that jointly back the substitution concept will be required to build trust over the long term;

i) It is a difficult policy message that the LULUCF system complicates the work of establishing the role of forests in climate change mitigation. LULUCF has been very firmly established in the climate change bureaucracy and policies. Yet, this is a necessary message to convey. On the other hand, LULUCF is difficult to communicate and the proposed forestry system model may be more accessible to a wider audience;

j) Building trust and backing for the "forestry system" model will take time and requires endurance by stakeholders. Research institutions will be key in helping to develop the model and scenarios under different economic and ecological circumstances;

k) It is good that the model focuses on solutions, as opposed to problems/trade-offs. Further developments, especially integrating a wider range of management goals, should aim at embracing complex solutions, rather than complicated approached to trade-offs.

Continued improvement of data and methods

The roundtable group discussed technical aspects of the model and arrived at the following observations and recommendations:

General

- The summary of research in Holmgren and Kolar (2019) is useful and provides a good foundation for the SCA model;
- The model should be published in a scientific journal to bring more attention and stimulate continued research. For this, data from additional forestry corporation would be useful for a broader perspective. Södra was mentioned, and also companies that either lack own forests (eg sawmill corporations), or that have forests but lack own industries (e.g. Brevens Bruk);
- Some work on the system boundaries is required to ensure that the model is truly additive, i.e. double-counting of (or missed-out) climate effects are avoided when several entities (companies) are added together. This is also key for using the model for territories such as countries.

The Forest component

- There should be a stronger emphasis on the effect of active forest management for enhanced growth and sustainable harvests as the key driver of climate benefits, including substitution effects. For this purpose, the model could include ways to illustrate that (potential) substitution effects are generated already at forest harvests and then carried through to the different products;
- Some climate factors are currently not included, such as soil carbon developments, effects of changes in albedo, effects of non-CO_2 emissions. While less significant, these factors, and corresponding uncertainties, should be included in the documentation so as to avoid unnecessary critique;
- The conversion factors from stem wood to biomass should be clarified;
- There is a need for reviewing and debating the range of methodologies in circulation. In particular, the notion of “carbon debt” occurring at harvest is aggressively used in prominent publications (e.g. Searchinger et al., 2009) with unfortunate spillover effects in mainstream media (The Economist, 2013), but is inconsistent with the perspective of forest management across the entire forest at a given point in time, as applied in the current model.

The substitution effects

- If the model is to be used on a variety of situations in different locations, it is important to keep the set of product substitution categories at a generic level. In the current application by SCA only three categories have been used. If more specific sets of products, or specific sets of materials substituted, are used, then the model will also be difficult to use more widely, and the results difficult to compare;

- One exception to the above is the growing interest in and use of cellulose fibre for textiles. The substitution effect for textiles can be considerably higher than for other fibre products. With increasing volumes on a large market, it would therefore be important to establish substitution factors also for this product category.
- For the generic set of products we need a convergence of estimates of substitution effects. Efforts to harmonize methods for determining substitution effects should be launched, including to follow the development of these over time as the substitution effect will evolve with new technologies;
- Specifically, the substitution effects of fiber products (paper products, packaging, hygiene products) are difficult to obtain. The proxy used by SCA (energy conversion) is conservative and does not point to real-world opportunities for substitution. In addition, new fibre products are constantly emerging, which makes this a moving target. Another complication is to handle products that combine bio-based and fossil-based materials.
- Substitution effects when using bioenergy instead of fossil-based energy also requires attention. Modern bioenergy conversion is highly effective, whereas older technologies have been criticized for very low conversion rates, thus all but eliminating the substitution effect. Older inaccurate data are still often used in research and reporting.

Next steps

The roundtable group identified the following priority actions regarding the forestry system model and the promotion of overall contributions of forestry and forest products in regulating the global climate:

a) The forestry system model as a whole, and the forest products substitution effects in particular, are not yet established as a reporting methodology. Developing an authoritative complement to official climate change reporting would require a standardization process through an established institution, for example SIS;

b) A strategic long-term initiative for communicating widely and influencing policy would be required to build general and better support for active forestry and forest products as key climate actions. For the Swedish forestry sector, the key geography for such initiatives is Europe and the key arena is EU policy processes in Brussels.

c) The current SCA report should be developed further, e.g. with examples from additional forestry corporations, and submitted to a scientific journal so as to stimulate further research in the field;

d) The use of the forestry system model by other forestry corporations, particularly in Sweden and Finland, should be encouraged and facilitated. An open database covering information and documented experiences should be established, possibly managed by the Swedish Forest Industries Federation.

e) On a national level, a summary of the climate impact of the forestry industry should be developed to illustrate the global climate impact of Swedish forestry and forest industry.

f) This roundtable report should be summarized in the upcoming report from KSLA on climate change, to which several roundtable participants are contributing.

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