informa SCIENCE-BASED INTEGRATED FOREST MANAGEMENT FOR CLIMATE MITIGATION
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Improved forest management practices integration into carbon certification schemes: where are we and how to move forward?

Introduction

Improved forest management can help mitigate climate change by increasing carbon removals in forests and wood products while ensuring the highest possible sustainable level of forest carbon stocks considering natural perturbances. Carbon certification standards worldwide already help incentivize climate mitigation practices in different sectors, including forestry. However, most forest carbon projects target avoided deforestation or afforestation projects. Improved forest management practices are also integrated within those schemes but are less developed due to their complexity and dynamic nature and the focus on economic forest-related instruments like REDD+ to non-Annex 1 countries. In Europe, however, those practices could be encouraged, especially to counterbalance the decline of forest sinks in some countries. There is an opportunity to do so as the European Commission is currently working on the creation of a carbon certification framework for removals in Europe. Forest carbon is, of course, part of it, along with other sectors: agriculture, peatlands, technological removals, etc. But, we must make sure that forest features and improved forest management strategies are properly taken into account within this new scheme. **This is where INFORMA comes in!**

The challenges of forest carbon MRV

INFORMA aims to provide recommendations on how to properly integrate forest carbon within carbon certification standards. More specifically, we mean to assess the conditions under which we can give financial incentives based on carbon to improve forest management initiatives. It involves exploring technical options for both robust and affordable forest monitoring, reporting, and verification (MRV) as well as creating the market conditions for a wider acceptance, promotion and use of such instruments by private project developers, public institutions, and potential buyers.

Certification standards provide a set of requirements, procedures, and criteria for a range of eligible activities to verify that they have reduced emissions or removed GHGs through sink enhancements and are eligible for certification/payment: those sets of rules are what we call "methodologies". There are currently at least 50 forest certification methodologies in the world and nearly 15 improved forest management (IFM) methodologies. The IFM methodologies apply to existing forests where the implementation of alternative management increases carbon sequestration compared with a reference scenario. There is a significant gap in the ethical-legal foundations and definitions applicable to the internationally agreed tenure of environmental services, in contrast to the Voluntary Guidelines on Responsible Tenure in Agriculture, Fisheries and Forestry adopted in 2012 under the UN/FAO Committee on World Food Security (CFS). However, of all these methodologies and IFM projects that consider forest carbon, 193 million carbon credits have been generated since the first credits were issued in 2008. This represents 28% of all forest carbon credits (the majority of which are avoided deforestation (REDD+) credits) and 11% of all offset credits generated. Most of these credits were issued in the United States under ARB certification (80% of credits). Europe has very little validated and applied at scale IFM methodologies as of now, except for 2 in France, 1 in Spain, 1 in Finland and 1 in Germany.

Our analysis of these IFM methodologies draws heavily on the study by Haya et al. (2023) and looks at other methodologies from Australia and Europe especially. It identifies 4 main challenges linked to IFM project certification: 1) the diversity of practices under "improved forest management", 2) the risk of baselines, 3) the risk of non-permanence and 4) the integration of sustainability criteria. Those are not only technical challenges: there are also the pillars to guaranteeing the credibility of the project and the whole market and ensuring that buyers are ready to finance forest projects.

1. Conservation of management practices: what is an "improved forest management" practice under carbon certification?

What are we talking about: Improving forest management implies a change of practice in a forest

without land-use change. Those projects are harder to value within certification schemes than afforestation or avoided deforestation projects, as the carbon gain is often less important and harder to demonstrate even if it is compensated later. Some management practices even imply a decrease in the carbon sink, which takes time to compensate in the short and medium terms.

Challenge observed: Improving forest management means many different things, but most international methodologies focus on reduced harvesting: over 15 different practices are covered under IFM methodologies, ranging from conservation to management, through avoided degradation which today in Europe are exceptional. However, most methodologies actually target "conservation-like" practices, which tend to reduce harvest. Very few of them focus on management practices like thinning, enrichment plantations, or conversion of coppices for example.

This could be explained by the fact that those management practices may not store enough carbon to offset the project costs, or that it might be harder to demonstrate their impact, especially when it relies on resilience improvement. But we see methodologies for those practices developing in countries like France, so we could tell in a few years if there is a real potential for development.

Recommendation: A diversification of practices ensuring effective improved forest management, including for example enhanced thinning of stands leading to additional growth and higher quality raw material, or a risk management strategy that avoids massive carbon emissions due to diebacks, storms, fires, etc. could be very useful in Europe. We would need to develop additional methodologies that target this wide range of practices and are backed by science to demonstrate carbon impact and risk reduction.

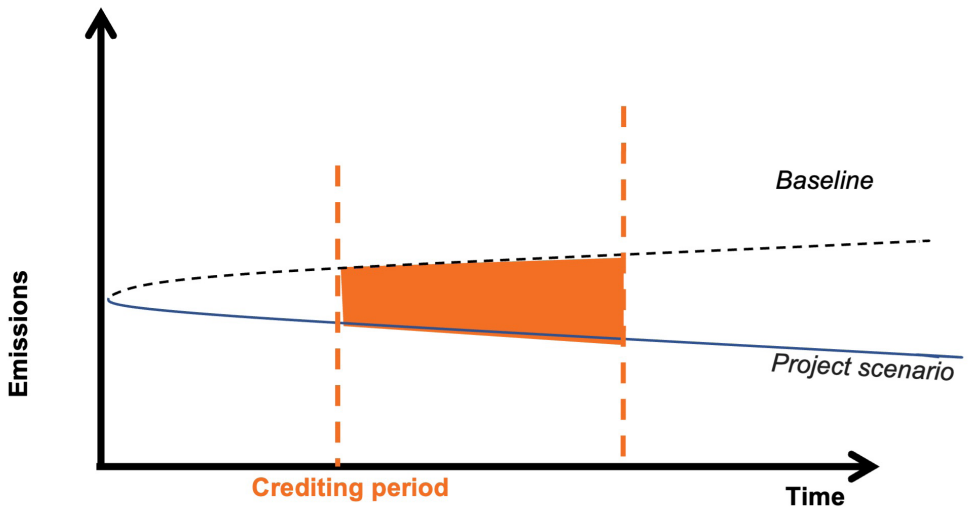
2. Baselines: the main risk of carbon certification projects

What are we talking about: A project's baseline represents the type of land management that most likely would have occurred in the absence of the carbon project. It is the scenario against which a project's carbon impact is measured. The baseline (counterfactual) is inherently uncertain because once a project takes place, the baseline will never occur and so can never be observed. Baseline choice has a large effect on the number of credits issued, so baseline, credibility and conservativeness are important to the quality of offset credits (Griscom et al., 2009).

Challenge observed: The main risk linked to carbon certification standards lies in the establishment of the baseline, the direct consequence of which is over-crediting. Most methodologies offer substantial flexibility in setting project baselines. Where there is flexibility, project developers have a financial incentive to choose the option that generates the most credits. Weaknesses in baseline design and validation have been the most important loopholes in recent carbon offset scandals (see, for example, West et al., 2024).

Recommendation: Several changes to the methodologies could result in more accurate and conservative baselines, for example:

- Limit the choice given to project developers to define their baseline, to limit information asymmetry and risk of bias.
- Explore the use of dynamic baselines which are adjusted ex-post by comparing the outcome of the project to changes in similar areas without projects.
- Choose baselines close to initial carbon stocks, to encourage landowners to change their land



Source: I4CE

management practice (compared to the past, present, or other similar lands dynamically).
- Measure the result and provide the payment after the proof of the carbon stock increment.

For these reasons, the most important avenue for improvement in project monitoring does not lie in state-of-the-art sensors and monitoring technologies, but rather in more careful guidelines on baseline setting, using both theoretical and empirical knowledge from economics (e.g. information asymmetry, selection bias, and how to minimize their effects).

3. Carbon certification tools need to better integrate the future impact of climate change to ensure carbon permanence

What are we talking about: Carbon sequestration projects in biomass or soils present a risk of non-permanence, i.e. the re-emission of carbon into the atmosphere, and are very difficult to measure. Forest carbon can especially be released by "unavoidable" natural events such as fire, drought, disease, and storms. To deal with this risk and ensure carbon storage over a designated period, certification standards use tools like buffer accounts: some tons of CO2 generated by the project are set aside, depending on the level of risk of reversals estimated for the project.

Challenge observed: The future impact of climate change on forests is probably underestimated in non-permanence management tools. The methodologies likely under-allocate credits to the buffer pool, in large part because they do not adequately address the increasing risk of reversal or the decrease of tree growth rate due to climate change. The buffer could therefore be at risk if important natural events, like fires, for example, occur.

Recommendation: Larger buffer pool deductions along with regularly updating the protocols based on the latest science would help to address this issue. Methodologies may also consider incentivizing practices that reduce carbon in the short run but increase resilience in the long run, like thinning and fuel treatments that reduce the risk of catastrophic wildfire.

4. Increase visibility and robustness for sustainability criteria

What are we talking about: Most carbon projects also take into account their impact on other sustainability issues: biodiversity, water, local economy, etc. There are two (complementary) ways to do it: 1) imposing safeguards, which means ensuring that the project has no negative impact on other ecosystem services or socio-economic aspects and/or 2) establishing criteria and indicators to evaluate the positive impact of the project beyond carbon.

Challenge observed: In practice, there is significant heterogeneity between IFM methodologies in the ways to integrate sustainability impacts: each methodology sets its own rules, creating a lack of clarity for project financiers.

Recommendation: guidelines for integrating and measuring sustainability issues could be drawn up to ensure greater consistency between methodologies and greater transparency for projects. It will especially be important in Europe as it has been decided that carbon projects within the CRCF will have to demonstrate not only a neutral but a positive impact on biodiversity and soil health.

The main criteria for carbon projects, to ensure robustness and credibility for buyers

» *Additionality* in the context of carbon credits refers to the principle that a project's emissions reductions or carbon sequestration should be additional to what would have occurred without the project.
» *Quantifiability* refers to the ability to accurately measure and quantify the amount of greenhouse gas emissions reduced, avoided, or sequestered by a particular project. Quantifiability involves establishing robust measurement methodologies, collecting relevant data, and applying appropriate calculation techniques.
» *Transparency* refers to openness and accessibility of information related to the generation, certification, and trading of carbon credits. This is accomplished through MRV frameworks
» *Permanence* refers to the assurance that carbon stored or sequestered through a project remains stored over the long term, thus effectively reducing the atmospheric concentration of greenhouse gases for an extended period.
» *Sustainability* refers to ensuring that emission reduction projects not only contribute to mitigating climate change but also promote broader sustainable development goals, including social, environmental, and economic benefits.

Conclusion

Carbon certification has the potential to create significant incentives for forestry projects with mitigation benefits via sequestration in forest ecosystems and storage in wood products. However, markets are not equally developed in Europe, and few countries have implemented their own rewarding schemes. This is why the CRCF developed at the EU level is a real opportunity to value carbon and direct public and private funds towards impactful mitigation practices all over Europe.

This analysis shows how existing or future improved forest management methodologies can be improved to create more trust in forest carbon certification and give credibility to the whole market. The CRCF will necessarily need to focus on the demonstration that projects avoid over-crediting and guarantee reasonable permanence through adapted buffers, for example. This will be a challenge, as competition with technological removals will be hard in the European market, but it is crucial if land-use removals are to continue to be funded because of the increasing risk of non-permanence of carbon due to the impacts of climate change. Nature-based solutions have definitively many positive impacts other than those on the climate, and identifying and valuing these co-benefits is the way forward. Finally, buyers will also have to really step in, which mean go way further than the very low carbon prices visible internationally.

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