



Forests and climate change: an overview

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Towards best practices for adaptation and mitigation

This is a crucial year for the international efforts to address climate change, culminating in COP 15 of the United Nations Convention on Climate Change (UNFCCC) in Copenhagen on 7-18 December. There, Parties to the Convention and the Kyoto Protocol are expected to agree on an ambitious and effective international response to climate change for the next commitment period.

It is also a crucial year for the world's forests. The Copenhagen agreement will likely include a range of forest-related adaptation and mitigation measures. The mechanism for reducing emissions from deforestation and degradation (REDD) has been the most debated measure on the road to Copenhagen.

The challenges after Copenhagen will be to put into practice whatever is agreed, and to develop the approaches, policies and practices needed to effectively integrate the objectives of climate change mitigation and adaptation with sustainable forest management (SFM) and biodiversity protection. These approaches must at the same time contribute to the welfare of rural people in developing countries.

Forests and climate change are intrinsically linked, in ways that extend beyond carbon. Climate change and global warming could change the forest landscape worldwide and vice versa. Changes in global climate — through higher mean annual temperatures, altered precipitation patterns and more frequent and extreme weather events — may have diverse effects on forests, including stress, compositional and functional changes, and changes in the capacity of forests to provide products and services. These effects are as yet poorly understood.

Forest ecosystems capture and store carbon dioxide (CO₂), making a major contribution to the mitigation of climate change. When forests are destroyed, over-harvested or burned, however, they can become a source of CO₂ emissions.

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From the perspective of climate, SFM is a means of achieving the goals outlined by the UNFCCC with respect to forests:

- using forests for carbon capture and storage, thus reducing the emissions of greenhouse gases — in this way, forests become part of a climate strategy for mitigation; and
- using forests and trees as part of a strategy to cope with impacts of climate change — in this way, forests become part of a climate strategy for adaptation.

Anticipating the international policy dialogue and the expected outcomes at COP 15 in Copenhagen, a wide range of forest carbon activities has emerged over the last decade. Several bilateral and multilateral initiatives have supported countries in becoming “REDD ready,” such as the World Bank’s Forest Carbon Partnership Facility (FCPF) and Forest Investment Program (FIP), and FAO and UNEP’s UN-REDD.

On the forest side of the spectrum, it is commonly agreed that an agreement on a REDD mechanism would provide a global incentive for the conservation and sustainable management of forests.

For many years, forest policy-makers, managers and practitioners have worked to conceptualize and implement SFM. The concept of SFM includes a broad range of objectives — from use to conservation — and different types of forests, including natural forests, plantations, agroforests and trees in landscapes. The focus is on multiple uses of the forest, the production of both forest ecosystem goods such as timber, non-timber forest products (NTFPs) and services such as climate regulation, biodiversity conservation and watershed management as a way to contribute to sustainable development. SFM is holistic in nature, encompassing ecological, technical, socio-cultural, economic and political-institutional dimensions.¹ Experiences in the past decades unequivocally demonstrate the importance of addressing forest governance as key in achieving SFM.

A REDD agreement in Copenhagen will likely be broad, and will probably include general provisions on scope, implementation, monitoring and verification, incentives and types of support. The details, including the identification and application of best practices, will largely be left to the countries/parties provided they comply with the general conditions.

This issue of ETFRN News aims to contribute to a better understanding of the role of forests and their management in climate change mitigation and adaptation. It presents some promising approaches and measures and the enabling conditions needed. The articles in this issue are the result of an open call for papers. They do not cover all issues and initiatives that are relevant to the forest-climate connection; this was not the goal. Nevertheless, the issue brings together a lively mix of articles with a wide range of perspectives, varying from papers with an international policy focus and conceptual pieces, to field experiences written by individuals who do not often address an international audience. Collectively, the articles constitute a broad-ranging insight to the importance of forests in climate change and some of the challenges that need to be addressed at the different levels — from local to global, from policy to practice — to make things work.

This introductory article synthesizes some of the main issues and developments that emerged from the articles and concludes with some reflections on the way forward. The synthesis, like the ETFRN News, is organized into six sections:

- International policy;
- Country-level REDD experiences;
- Forest management practices;
- Climate adaptation strategies;
- Landscape restoration in practice; and
- Forest carbon business approaches.

International policy

Clabbers (1.1.) writing from the perspective of a climate negotiator, briefly outlines the history of the discussions under the UNFCCC on tropical forests. The topic of deforestation in the international climate negotiations seemed to be taboo for many years, but developing countries with a considerable forest cover pushed it back on the climate agenda. Since then, it has been discussed under different abbreviations, such as RED, REDD and REDD+. It is likely that some kind of arrangement on reducing deforestation and/or degradation will be agreed at COP 15. There are four main outstanding issues in Copenhagen:

- the scope of the instrument (i.e., RED or REDD+);
- the mechanism (should there be one financial mechanism for REDD+, or separate mechanisms for REDD and the “+”);
- the finance mechanism (fund-based or market-based); and
- how countries should establish baseline reference levels for deforestation and degradation.

Whatever the outcome in Copenhagen, better protection and more sustainable use of forest resources will remain one of the main environmental and social challenges of the coming century. Pistorius (1.3) questions what REDD can or should mean for biodiversity. He argues that it would be shortsighted not to consider biodiversity and livelihoods needs; they should be addressed simultaneously and comprehensively, so as to generate multiple benefits for the environment and for the people who depend on forest resources.

Discussing the pitfalls and possibilities of conserving carbon in tropical forests Putz and Zuidema (1.4) emphasize that there are clear trade-offs between retaining biodiversity and maximizing carbon and timber yields, and that these trade-offs must be managed. They also state that most managed forests fall far below the efficiency frontier, with less than maximum biodiversity loss and carbon sequestration. Established forest management practices — such as forest fire management, reduced-impact logging, post-logging silviculture treatments and tree planting — can all help mitigate climate change and render forest ecosystems more resilient for multiple purposes. This calls for a system for monitoring and verification that goes beyond carbon storage by explicitly including the social and environmental principles and criteria of sound multiple-use management. This broader approach will remain difficult to achieve if participants in Copenhagen focus only

on carbon stocks in forests. Putz and Zuidema also highlight the need to connect REDD programs to efforts to control illegal logging (e.g., FLEG and EU-FLEGT).

Van Noordwijk and Akon (1.2) argue that the definition of “forest” could become a major bottleneck in the implementation of a climate agreement. The progression of concepts — from RED to REDD to REDD+ to REDD++ — reflects a tendency to include a larger share of total land-use change. The logical end point is to account for all land use: Reducing Emissions from Any Land Use (or across all land uses) or REALU. A comprehensive REALU approach can likely incorporate trees outside forests, agroforestry systems and community-based forest management. Recent analysis suggest that one billion hectares, or 20 percent of the world’s agricultural lands, have at least ten percent tree cover. In the Southern Africa Peace Parks project, developed in a savannah environment, Termeer et al. (2.4) find that the existing definition of forest proved problematic when deciding what to include in carbon measurements.

Country-level REDD experiences

Westholm et al. (2.1) observe that REDD readiness activities encounter many problems in the first phase: defining the baseline for deforestation. Collecting relevant forestry and biomass data — necessary to determine forest carbon stock — is very time consuming. Furthermore, carbon measurement data is not always accurate and compiling the information can increase transaction costs (Termeer et al. 2.4; van Midwoud, 6.2).

Several authors emphasize the importance of local and indigenous community involvement in REDD. Guyana’s Low Carbon Development Strategy (2.3) includes awareness and consultation sessions. The financial sustainability of REDD activities is also important: if opportunity costs of alternative land uses rise in the future, communities’ commitment to REDD could cause them to forego profits (Westholm et al. 2.1; Benneker and McCall 2.2).

In a case study from Mexico, Benneker and McCall (2.2) show that existing forestry programs have the potential to reduce forest degradation and enhance carbon stocks inside and outside the forest. Governments must ensure that these programs continue to benefit local people when integrated into a REDD strategy. The authors note that in Mexico REDD payments based on reduced forest degradation and enhanced carbon stocks are more likely to benefit farmers and communities than payments based on reduced deforestation.

The article on international forest landscape auctions (Termeer et al. 2.4) outlines some important issues in attracting funds from the voluntary market. A lack of up-front financing and the costly and slow process of certification have contributed to the failure of this innovative approach. Land and user rights need to be clear and secure to attract external money. Opportunity costs for alternative land uses is another factor that determines the success of REDD projects. If alternative land use (for example, extensive cattle ranging) is very profitable, it will be difficult for carbon money to be competitive. An interesting example is Guyana (2.3), where a baseline study suggests an opportunity cost for avoiding deforestation of US\$580 million per year.

Many promising REDD projects have depended largely on the voluntary market, which may put longer-term sustainability at risk (Termeer et al. 2.4). The current global economic crisis has already shown that companies are engaging in fewer voluntary carbon activities. An international REDD mechanism could overcome this problem, but small-scale projects will probably continue to depend on the voluntary market, because of the high transaction costs for certification under REDD schemes (van Midwoud 6.2).

Forest management practices

In what way and to what extent will the incorporation of climate change objectives affect sustainable forest management? Broadhead, Durst and Brown (3.1) state that it has brought new actors and opportunities to forestry and that much of the practices needed for SFM are equally relevant to climate change adaptation and mitigation. Adaptation and/or mitigation objectives must be made more explicit in forest management, within realistic parameters. Many challenges exist outside the forestry sector, such as competing land-use claims, conflict and corruption.

SFM in Sri Lanka (Keller 3.2) is a practical example of climate objectives being incorporated in existing management practices. Many strategies and practices developed to advance SFM also help to achieve the objectives of climate change adaptation and mitigation. It is important that initiatives address both short- and long-term impacts on livelihoods and climate. Often the key motivating factor in protecting the forest is a direct benefit (in this case the electricity generated by a downstream micro-hydro power plant) rather than forest conservation itself.

Given the environmental and social conditions in Southern Sudan, Husgafvel (3.3) states that the promotion of multipurpose trees on farm and rangeland could be an effective strategy to improve the mitigation and adaptation capacities of the existing land use. Training, extension and capacity building are important elements. Capacity building work should focus not only on forest management practices alone, but on wider governance issues as well.

Mishra and Singh (3.5) highlight the changes in climate predicted in parts of India, and ways in which participatory forest management could respond. Indigenous communities are particularly vulnerable. They are not just victims of global warming, however; they can be critically important in supporting global adaptation to climate change. Community participation, supported by the forest department, is a vital part of forest management.

Zanetti and Casagrande (3.4) make a plea for an accounting system to trace forest carbon from stands to finished products, based on the experiences in Southern Brazil with sustainable wood production for social housing projects. Building high-quality houses with high-quality wood can help the construction sector mitigate climate change. This is especially true in situations where timber for such projects is derived from new plantations, in this case the deforested landscape around Curitiba.

Climate adaptation strategies

Two articles in this issue of ETFRN News deal specifically with forests and climate change adaptation strategies. Sonwa et al. (4.1) discuss a multi-stakeholder needs assessment to identify adaptation measures in the Congo Basin, a region where many livelihoods directly depend on forests. Bio-energy (including fuelwood), NTFPs for food and medicines, and water have been identified as forest-related priorities for climate adaptation strategies. SFM is seen as a way to achieve climate change adaptation and mitigation as well as poverty reduction and economic and social development. Some of the tools being used are vulnerability maps and the development of adaptation strategies using forest resources. Sonwa et al. make the notable observation that there are very few explicit references as to the role of forests in climate adaptation and mitigation strategies in Central Africa's existing climate adaptation strategies.

Kalame (4.2) reviews a program in the transition zone of Ghana to promote a taungya system as a climate adaptation strategy. The taungya system includes many of the elements of an adaptation strategy. Several challenges are mentioned, such as a lack of clear ownership agreements on trees and land between the government and other stakeholders; using accountability and consultation to ensure stakeholder involvement in the government-led programs; and meeting the livelihoods needs of farmers in the medium term. The existing Ghana Forest Strategy does not focus on climate change adaptation. Understanding existing forest policy activities and programs and their strengths and weaknesses is key to the formulation of international policy on forestry and sectoral policy on climate change issues.

Landscape restoration in practice

All five cases in this section are relatively small-scale efforts: four of them are financed from the voluntary carbon market, one from public environmental money — the Caucasus case (Schulzke et al. 5.3), which is financed by the German government. All of them affirm that carbon sequestration should not be the only criterion for planting forests, as forests have a number of other essential social, ecological and economic functions. In the Caucasus case (5.3) multipurpose forest management protects the soil from erosion, avalanches and flooding. Reforestation and restoration activities are aimed at establishing indigenous forest types, paying careful attention to the provenance of the planting material. The project also addressed the need for short- and medium-term benefits for local people in terms of forest products, income generation and employment.

Engels (5.2) describes how protection and restoration of the remnant *Araucaria* forests in southern Brazil is important not just for biodiversity but also helps to mitigate climate change. Maintaining and restoring the forest will diminish the impact of frost and drought on agriculture, particularly coffee and citrus crops.

Van 't Riet (5.4) describes the case of a community forestry project on Mount Malindang in the Philippines. Local people are managing the project, which proved to be very successful. Projects such as Mount Malindang not only help to sequester CO₂, but have

many other benefits, such as the protection of biodiversity and soil and — perhaps most importantly — improved living conditions for the local population. The author explicitly challenges the high costs of current CO₂ certification systems, which prevent small-scale projects from participating, and suggests that more people in low-salary countries be trained to do the work.

Another option for small-scale projects is to refrain from certification and rely instead on trust, as was the case in Costa Rica described by Westerink and Soto (5.5). Funding for the project came initially from biodiversity conservation sources, but more recently from voluntary climate funds. The flexible approach of the carbon funds provider — who has trust in both the Dutch and the Costa Rican parties — contributed to the success.

Analyzing the rural communities near the remnants of M^ata Atlantica forests in Brazil, Silveira (5.1) emphasizes that landscape restoration efforts can benefit from anthropological insights. A concrete example is knowledge of land heritage systems that can be used to promote forest restoration. Water security and fuelwood access can also motivate rural communities, especially women, to conserve and restore their forests (3.2, 5.1 and 5.5).

Forest carbon business approaches

Thoumi (6.1) calls for forestry carbon projects to be framed within an appropriate business strategy that is grounded in effective communication between science, civil society, government and the business community. One of the interesting aspects of this article is the concept of inter-generational equity. Economic discounting practices and current financial analyses are challenged, because of their assumption that production in the future counts less than production now. The generations who follow will still need forests and their services (and a decent climate). Perhaps forests and forest carbon should become an alternative investment asset class, wherein lower financial discounting rates are applied for reasons of sustainability and inter-generational equity.

Van Midwoud (6.2) reviews the experiences with forest and carbon certification of afforestation and reforestation (A/R) projects under the Clean Development Mechanism (CDM) and the lessons to be learned for REDD. After 12 years of CDM, more than 1700 projects have been registered; only six of them are A/R CDM projects. Van Midwoud mentions three major conceptual reasons for this: 1) high transaction costs; 2) lack of demand for the carbon credits of A/R CDM; and 3) the poor reputation of tree-planting as an instrument to combat global warming. The voluntary carbon market proved to be much more successful in enhancing A/R-projects as it provided a solution to these three problems of the compliance market. In order for REDD to become a success, methodologies and procedures must be more workable and less complicated than under the CDM.

Van Midwoud also notes some other lessons to make private sector involvement in REDD more effective and attractive. Credible institutional structures and good governance are needed, as is capacity building for the design and management of marketable forest carbon projects. These projects should adopt a multiple use approach in their design.

He also observes that the groups working on climate forest projects often differ from those working on other types of forest projects. This is unfortunate, since many of the management practices needed in climate forest projects are also required for sustainable forest management.

Some reflections on the way forward after Copenhagen

There is broad support for including forests in a future agreement on global climate change. Reducing deforestation and forest degradation through better forest governance and management will contribute to mitigating climate change. Better forest management may further help people adapt their livelihoods in the face of the inevitable changes in climate that will occur in the coming decades. The challenge after Copenhagen will be to translate goals and agreements into policies and practices that work. For that, political will is needed.

The forest community and the climate community are currently worlds apart. In the implementation of the Copenhagen agreement, these two communities need to be better linked to increase mutual understanding and develop shared visions and objectives for effectively combating climate change. The forest sector should increase its ability to engage effectively and strategically in the agendas of relevant sectors and to prove the importance of forests to other constituencies.

Adaptation and mitigation: two sides of the same coin

From a forest management perspective adaptation and mitigation can be seen as two sides of the same coin: what is good for adaptation is also good for mitigation and vice versa. A major lesson is that adaptation and mitigation objectives must be included more explicitly in regular forest management plans and countries' national forest programs.

SFM already addresses climate change objectives

Most authors agree that the measures needed to enhance the mitigation and adaptation potential of forests are largely the same practices and policies that have been identified for achieving SFM in the past. Climate objectives are most effectively and sustainably achieved if they are embedded in a multiple use forest management approach. No single author in this volume — including those from private forest enterprises, carbon certifiers and companies that buy carbon credits — argues that forests should be managed for carbon alone. Managing forests for multiple objectives also means recognizing the trade-offs that exist between, for example, timber production, carbon storage and biodiversity conservation. Managing these trade-offs to generate a mix of goods and services is the core challenge of SFM. Of course there is plenty of room for improvement through the application of effective management practices, most of which are already at hand.

The factors that prevent implementation of adaptation and mitigation measures are the same ones that drive deforestation and poor forest management. They are already well understood, but most of them are not easily addressed as they are tied to institutional capacities and governance.

SFM is already an important tool in the implementation of other Rio conventions such as the Convention on Biological Diversity and the United Nations Forum on Forests. A further definition of SFM, with clear criteria and indicators that address the multiple functions of forests, should be a joint exercise of the relevant policy fora.

Implementation on the ground

The topic of forests and climate change is in need of innovation. The diversity of cases in this EFRN News illustrates the innovative approaches that are currently being developed. Collectively they show the capacity at the local level to think in new ways. One-size-fits-all solutions are neither feasible nor desirable. Approaches that will have an impact are necessarily flexible and adaptive and require incentives that allow for this flexibility. In order to scale up promising pilot activities, it will be important to analyze experiences and lessons learned from current initiatives. Subsequently, these experiences need to be shared through the low-cost channels available in developing countries.

The system of monitoring, reporting and verification (MRV) is an important part of making REDD operational in countries. Although methodologies, procedures and remote-sensing technologies are available, the challenge for many nations lies in developing the in-country capacities and institutions needed to manage and operate the MRV system effectively within a short time span. Not all countries will be able to comply with the demand for credible data needed for REDD. This may reduce REDD's coverage and impact in the coming years and could add to the argument to keep expectations realistic as to the pace of implementing it.

The voluntary carbon market will continue to be important after Copenhagen. The size of the market will largely be determined by the complexity of rules set and the enabling environment created for responsible businesses at international and national levels. There is a strong need for innovative business approaches that are based on multiple forest uses and multiple sources of financing, including enterprise-community and public-private partnerships.

Carbon certification is an important mechanism upon which payments for the sequestered carbon can be based. In recent years several carbon standards and certification schemes have emerged parallel to the existing measures for SFM and biomass production. This proliferation of forest-related standards could be problematic; it is not yet clear how the different systems evolve and relate to each other. It may result in inconsistent requirements, confusion in the market and increased transaction costs and inefficiencies. There is a clear need for harmonisation and coherence.

Certification is not necessarily the only credible basis for payment. As illustrated in this issue, mutual trust can be an alternative, particularly for small-scale initiatives that cannot afford the high transaction costs of certification.

Good governance

The importance of governance underpins the effective integration of forest and climate change objectives. Better integration of REDD and forest law enforcement and governance initiatives to create synergies and avoid duplication is one example. Countries and their policy and operational frameworks are the most logical level at which to integrate these multiple objectives. Capacity-building will have to go beyond technical issues and focus on the country's governance and institutional structures. In the end, political will, credibility, trust, transparency, equity and justice are the factors that ultimately define the functioning and impact of any system.

Local populations need to be involved in a meaningful way to create co-benefits for their livelihoods, biodiversity and other environmental services. Not addressing "people" and "planet" considerations is increasingly seen — by both the public and private sector — as a business risk.

Integrating climate change objectives in community-based forest programs creates additional benefits and livelihood opportunities. But community engagement in REDD schemes and the forest carbon market is not without risks, as it may also limit control over resources and future development options. To make these risks transparent and manageable is a prerequisite in the design of a program. Open and equitable participation by communities in design and decision-making is essential.

The role of forests must be clarified and articulated in National Adaptation Programs of Action (NAPAs). At present most political attention and financing is focused on REDD, and, in general, on climate mitigation. Only recently has the concern for the role of forests in adaptation gained ground; this emanates from the growing recognition that climate change will happen anyway. Moreover, climate change will affect the most vulnerable ecosystems and poorer regions. The people living in these areas usually contribute least to climate change, but may suffer most of its effects, as they usually lack the means to adapt. It is also well evidenced that trees and forests in these areas are an important safety net. Adaptation efforts will have to be closely linked to the poverty agenda.

REDD and other forest-based climate change mitigation measures are likely to be low-cost and effective in the short to medium term. Some stakeholders fear that forests may become a too-cheap mitigation option and corrupt the overall climate agreement. In most calculations, however, the costs of developing, operating and managing the institutional system required to produce credible and sustainable forest carbon credits are not internalized in forest carbon prices. If they were, forest carbon prices would become much higher and more realistic.

Endnote

1. Sustainable forest management is defined by the UN General Assembly as follows: "Sustainable forest management is a dynamic and evolving concept aiming to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations" (UNGA Resolution December 2007 resolution 62/98 on non-legally binding instrument on all types of forests).