CBD

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BIODIVERSITY AND AGRICULTURE

SUMMARY OF INFORMATION ON THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY RELEVANT FOR REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION IN DEVELOPING COUNTRIES (REDD)

Introduction

At its ninth meeting, the Conference of the Parties to the Convention on Biological Diversity (CBD), requested the Executive Secretary to summarize information on the conservation and sustainable use of biodiversity relevant for Reducing Emissions from Deforestation and Forest Degradation in developing countries (REDD) found within existing documents. Parties further requested that the Executive Secretary provide this information to the Executive Secretary of the United Nations Framework Convention on Climate Change with the intention that it be transmitted to the third and subsequent sessions of the Ad Hoc Working Group on Long-term Cooperative Action (decision IX/16, paragraph 16).

In response to this request, the Executive Secretary has prepared the attached summary including relevant information from CBD publications such as Technical Series Nos. 4[1], 10[2], 25[3] and 29[4] and the report of the Viterbo Workshop on "Forests and Forest Ecosystems: Promoting Synergy in the Implementation of the three Rio Conventions" (April 2004)[5]. The summary also includes information from reports to which the CBD contributed, such as the Millennium Ecosystem Assessment[6] and the Intergovernmental Panel on Climate Change (IPCC) Technical Paper V “Climate Change and Biodiversity”[7].

Biodiversity, Productivity and Carbon Sequestration

Forest ecosystems store large quantities of carbon in vegetation and soil. They exchange carbon with the atmosphere through photosynthesis and respiration. They can also be sources of atmospheric carbon when they are disturbed. In the case of carbon stored in a standing forest that is close to “carbon

[1] Secretariat of the Convention on Biological Diversity (2001). The Value of Forest Ecosystems. Montreal, SCBD Technical Series No. 4.
[2] Secretariat of the Convention on Biological Diversity (2003). Interlinkages between Biological Diversity and Climate Change. Advice on the Integration of Biodiversity Considerations into the Implementation of the United Nations Framework Convention on Climate Change and its Kyoto Protocol. Montreal, SCBD Technical Series No.10.
[3] Secretariat of the Convention on Biological Diversity (2006). Guidance for Promoting Synergy Among Activities Addressing Biological Diversity, Desertification, Land Degradation and Climate Change. Montreal, SCBD Technical Series No. 25.
[4] Secretariat of the Convention on Biological Diversity (2007). Emerging Issues for Biodiversity Conservation in a Changing Climate. Abstracts of Poster Presentations at the 12th Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity. Montreal, SCBD Technical Series No. 29.
[5] http://www.unccd.int/workshop/docs/finalreport.pdf
[6] Millennium Ecosystem Assessment (2005). Washington, Island Press.
[7] Gitay, H., Suárez, A., Watson, R.T., and D.J. Dokken (2002). IPCC Technical Paper V – Climate Change and Biodiversity. IPCC, Geneva, Switzerland. pp 85.

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balance", there is an economic value to the carbon stored however, whether such a forest can realize such storage values depends on what is likely to happen in the absence of some protective or sustainable-use measure. Forests that are threatened in the near-to-medium future have a storage value that can be realized through protective measures.

Currently, the biosphere is a net sink of carbon, absorbing approximately 20 per cent of fossil-fuel emissions. Terrestrial ecosystems alone currently absorb carbon dioxide (CO_2) at a rate of about 1–2 gigatonnes (Gt) of carbon per year. Carbon release or uptake by ecosystems affects the CO_2 and methane (CH_4) content of the atmosphere at the global scale and thereby global climate. As such, forest, agricultural lands, and other terrestrial ecosystems offer a significant potential for climate-change mitigation through changes in land use (e.g., afforestation and reforestation), avoided deforestation, and agriculture, grazing land, and forest management. The estimated global potential of biological mitigation options is on the order of 100 Gt C (cumulative) by the year 2050, equivalent to about 10-20 per cent of projected fossil-fuel emissions during that period, although there are substantial uncertainties associated with this estimate. The largest biological potential is projected to be in subtropical and tropical regions.

An average closed primary forest contains some 280 tonnes of carbon per hectare and, if converted to shifting agriculture, would release about 200 tonnes of carbon. Open forests would begin with around 115 tonnes of carbon per hectare and would lose between a quarter and third of this amount when converted. Furthermore, a study using Norway's carbon tax of about USD $49 per tonne of CO_2 as an expression of the social cost of fossil fuels, shows that the implied value of the forest as a carbon sink in Norway exceeds the value of the forest stand as timber by a factor of between 3 and 30, depending on the discount rate used.

At present, deforestation and land-use change are estimated to contribute to approximately 20 to 25 per cent of carbon emissions, in addition to being a major cause of global biodiversity loss. The mitigation potential of slowing rates of tropical deforestation has been estimated to be about 11-21 Gt of carbon over the period 1995-2050 on 138 million hectares. Protection of forests through REDD therefore has the potential to deliver both climate-change-mitigation and biodiversity-conservation benefits.

Some components of biodiversity affect carbon sequestration and thus are important in carbon-based climate-change mitigation when afforestation, reforestation, reduced deforestation, and biofuel plantations are involved. Biodiversity affects carbon sequestration primarily through its effects on species characteristics, which determine how much carbon is taken up from the atmosphere (assimilation) and how much is released into it (decomposition, combustion). Particularly important are the speed at which plants can grow, which governs carbon inputs, and woodiness, which enhances carbon sequestration because woody plants tend to contain more carbon, live longer, and decompose more slowly than smaller herbaceous plants. Plant species also strongly influence carbon loss via decomposition and their effects on disturbance.

Biodiversity and Permanence

Biodiversity and permanence are important components to consider when designing REDD projects. Ecosystem resilience, which is generally accepted to be linked to biodiversity in most cases, increases the permanence of the carbon pool. Usually, areas allocated to conserve biodiversity represent long-term and more secure stores of carbon. Normally, relatively mature ecosystems are preferred for conservation purposes, and they are usually managed to reduce the likelihood of disturbance, thus minimizing human activities that could release stored carbon. As such, protected areas represent a form of avoided deforestation or devegetation.

Benefits to Biodiversity from REDD

In addition to climate--change mitigation benefits, slowing deforestation and/or forest degradation can provide substantial biodiversity benefits. Primary tropical forests contain an estimated 50–70 per cent of all terrestrial species, and tropical deforestation and degradation of forests are major causes of global biodiversity loss. Tropical forests are currently experiencing significant rates of deforestation (averaging 15 million hectares annually during the 1980s, and emitting 1.6± Gt of carbon per year). Tropical deforestation and degradation of forests are major causes of global biodiversity loss. Deforestation and forest degradation reduces the availability of suitable habitats for species coexistence, may cause local extinctions, and can decrease both population and genetic diversity. Hence, reducing the rate of deforestation and degradation is key to halting the loss of biodiversity in forests.

Pilot projects designed to avoid emissions by reducing deforestation and forest degradation have produced marked ancillary environmental and socio-economic benefits. These include biodiversity conservation, protection of watersheds, improved forest management, enhanced livelihood options and local capacity-building. Sustainable forest management is also closely linked to reducing deforestation while enhancing biodiversity as well as to poverty eradication, employment and broader development goals. Although avoided deforestation is not currently an eligible Clean Development Mechanism (CDM) activity under the United Nations Framework Convention on Climate Change, it is an important mechanism to maintain biodiversity.

Projects to avoid deforestation in threatened or vulnerable forests that are biologically diverse and ecologically important can be of particular importance for biodiversity. Although any project that slows deforestation or forest degradation will help to conserve biodiversity, projects in threatened/vulnerable forests that are unusually species-rich, globally rare, or unique to that region can provide the greatest biodiversity benefits. In particular, projects that protect forests from land conversion or degradation in key watersheds have potential to substantially slow soil erosion, protect water resources, and conserve biodiversity. Projects that are designed to promote reduced-impact logging as a carbon offset may produce fewer biodiversity ancillary benefits than forest protection (i.e., not logging) at the site level, but may provide larger socio-economic benefits to local owners and prove to be a more viable option, particularly in areas where the communities are largely dependent on the forest for their livelihood.

In temperate regions, deforestation mainly occurred, when it did, several decades to centuries ago. In recent decades, deforestation has been most prevalent in the tropics. Since the remaining primary tropical forests are estimated to contain 50–70 per cent of all terrestrial plant and animal species, they are of great importance in the conservation of biodiversity. Tropical deforestation and degradation of all types of forests remain major causes of global biodiversity loss. Any project that slows deforestation or forest degradation will help to conserve biodiversity.

Afforestation, reforestation, and avoided deforestation projects may have off-site consequences, including implications for biodiversity. For example, conserving forests that would have otherwise have been deforested for agricultural land may displace farmers to lands outside the project's boundary. This has been termed "leakage". Projects may also yield off-site benefits, such as the adoption of new land-management approaches outside a project's boundary through technology diffusion or the reduction of pressure on biologically diverse natural forests. It is important that reduced deforestation in one location does not simply result in intended or unintended deforestation at another location.

Scenarios for Reduced Deforestation and Biodiversity Conservation and Sustainable Use

Projects under a REDD mechanism can be designed to maximize benefits to biodiversity conservation and sustainable use. Afforestation, reforestation, and avoided-deforestation projects with appropriate management, selection criteria, and involvement of local communities can enhance conservation and sustainable use of biodiversity. Specific management options to realize the synergies between carbon sequestration and biodiversity include adopting longer rotation periods, altering felling-unit sizes, altering edge lengths, creating a multi-aged mosaic of stands, minimizing chemical inputs, reducing or eliminating measures to clear understorey vegetation, or using mixed-species planting, including native species. Furthermore, forest-related investments have been proven to be one way of effectively addressing the objectives of all three Rio conventions at the same time. As such, a systematic analysis of where and when synergies come into play provides a very good opportunity to increase the cost effectiveness of Official Development Assistance (ODA).

The most effective and immediate way of increasing net sequestration in terrestrial ecosystems is to reduce deforestation to only the most essential levels. Much of the 2 million Gt of carbon released annually from forest clearance arises from the demand for agricultural and pasture lands in developing countries. Some of this is necessary to maintain food production levels; some clearing leads to only short-term uses before the land is abandoned as degraded grasslands and often maintained that way by frequent fires. In other cases, the land reverts to forest with an uptake of carbon, often to be cleared again. An immediate challenge to international institutions is to find a way to ensure that deforestation is limited to only that which leads to the long term delivery of essential ecosystem goods and services and that the services provided by intact forests are properly valued.

Scenarios that limit deforestation show relatively better preservation of regulating services. Tropical deforestation could be reduced by a combination of reduced tropical hardwood consumption in the North, technological developments leading to substitution, and slower population growth in the South (the "TechnoGarden" scenario in the Millennium Ecosystem Assessment) or through greater protection of local ecosystems (the "Adapting Mosaic" scenario). In contrast, in the scenarios that are not proactive with regard to the environment, a combination of market forces, undervaluation, and feedbacks lead to substantial deforestation not only in the tropics but also in large swaths of Siberia (the "Order from Strength" and "Global Orchestration" scenarios).

In addition, forest protection through avoided deforestation may have either positive or negative social impacts. The possible conflicts between the protection of forested ecosystems and ancillary negative effects, restrictions on the activities of local populations, reduced income, and/or reduced products from these forests, can be minimized by appropriate stand and landscape management, as well as using environmental and social assessments and by enhancing stakeholder involvement, including prior informed consent from indigenous and local communities.

Promoting synergies between REDD and biodiversity would also benefit from filling gaps in the knowledge base and stimulating discussion on forest conservation through practical experience and implementation of pilot projects. Within developing countries, a number of priorities have been identified including capacity-building, financial assistance and technology transfer. Specific attention should also be given to wildland fires and their management as an important component of national and local action.

Another scenario to enhance the effectiveness of REDD-biodiversity links is through data collection, dissemination and analysis, and the use of early warning systems to provide the data needed for policy planning and implementation of projects at local and national level. The specific data requirements, however, require identification.

Within the framework of sustainable forest management, there is a need for a system of criteria and indicators to address the synergistic value of sustainable forest management projects with the aim of finding win-win options and to increase the value of the project in terms of realizing multiple benefits. This would not duplicate the work of the regional criteria and indicator processes for sustainable forest management, but would rather complement it by identifying case-studies that countries consider as having a high potential for synergies.

Case-studies and articles on REDD and the conservation and sustainable use of biodiversity: abstracts of poster presentations at the twelfth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the CBD (Paris, 2007)[8]

Title	Authors	Summary
Achieving Multiple Benefits through a UNFCCC Mechanism on Reducing Emissions from Deforestation	Valerie Kapos, Lera Miles, Peter Herkenrath UNEP World Conservation Monitoring Centre	REDD mechanisms can provide opportunities to contribute towards the goals of a range of multilateral environmental agreements and mechanisms, including the CBD, by helping to ensure that forests continue to provide vital ecosystem services, conserve biodiversity, and enhance livelihoods. The design and implementation of the mechanism affects the degree to which these other benefits are obtained. The article also recognizes that efforts to reduce rates of deforestation can also be associated with risks to ecosystems services , depending on the drivers of land-use change that are causing forest loss.
Forests and Climate Change-Mitigation and Adaptation Activities in Polish Forest Management	Dr. Roman Michalak Ministry of the Environment, General Directorate of the State Forests, Poland	Polish national experiences show that sustainable forest management offers a significant potential to sequester carbon. The concept of sustainable forest management includes the three main climate change mitigation approaches: sequestration by increasing the size of carbon pools, e.g., through afforestation; reforestation and other activities, by conservation of existing carbon pools, i.e., avoiding deforestation; as well as by substitution of fossil fuel energy by the use of biomass. The case-study highlights the need for enhancement of cooperation between the climate, biodiversity and forest related processes.
Assessment on Peatlands, Biodiversity and Climate Change	Faizal Parish (Global Environment Centre) and Andrey Sirin (Laboratory of Peatland Forestry and Hydrology, Institute of Forest Science, Russian Academy of Sciences)	The large scale degradation of peatlands, including forested peatlands, has major implications for climate change, biodiversity and people. Peatlands are the most efficient carbon stores of all terrestrial ecosystems. However, anthropogenic disturbances have led to massive increases in net emissions of greenhouse gases from peatlands. Integrated management of peatlands is required incorporating a range of approaches on different land-use areas.

[8] Secretariat of the Convention on Biological Diversity (2007). Emerging Issues for Biodiversity Conservation in a Changing Climate. Abstracts of Poster Presentations at the Twelfth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity. Montreal, Technical Series No. 29, i–viii + 112 pages.

Title	Authors	Summary
Intact Forest Landscapes - Protecting Carbon and Biodiversity	Janet Cotter, Phil Aikman, Christoph Thies, Nathalie Rey and Martin Kaiser Greenpeace International	Using the example of the Democratic Republic of the Congo, the study demonstrates that the losses of carbon from forest fragmentation and selective logging are significant and that there is a need to protect Intact Forest Landscapes (IFL), not only for their biodiversity, but also for their carbon stocks.