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# SFM and the multiple functions of forests

The United Nations General Assembly defines sustainable forest management (SFM) as a “dynamic and evolving concept, which aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations”.<sup>1</sup> The SFM concept encompasses both natural and planted forests in all geographic regions and climatic zones, and all forest functions, managed for conservation, production or multiple purposes, to provide a range of forest ecosystem goods and services at the local, national,

regional and global levels. Criteria and indicators developed for boreal, temperate and tropical forests provide a framework to assess, monitor and report on the implementation of SFM based on: the extent of forest resources; biological diversity; forest health and vitality; productive functions; protective functions; socio-economic functions; and the legal, policy and institutional framework. Certification processes and best-practices guidelines have been developed to guide, assess, attest to and monitor SFM at the forest management unit level.

There has been significant progress in implementing SFM, but many challenges remain. The objective of this series of fact sheets produced by the Collaborative Partnership on Forests<sup>2</sup> is to inform decision-makers and stakeholders about some of the issues and opportunities facing the implementation of SFM in the 21st century.<sup>3</sup>

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## What is at stake?

*Forests have many functions.* They constitute an essential natural heritage and are important economic assets, and they are vital for sustaining the global environment. Forests provide a wide range of goods, such as food, wood and fibre, and ecosystem services, such as climate regulation, water catchment protection, poverty reduction, spiritual fulfillment and aesthetic enjoyment. Everyone depends on these goods and services, and many millions depend on forest-based employment for their livelihoods, yet over the past 50 years humans have changed forest ecosystems more rapidly and extensively than in any other historical period.<sup>4</sup> The conversion of forests into agricultural and grazing land and the general transformation of forest ecosystems have contributed to economic development, but not all regions and groups of people have benefited and many have suffered in socio-cultural, economic and environmental terms. Moreover, the full costs of deforestation and

forest degradation are becoming apparent through, for example, biodiversity loss, increased floods and drought, climate change and loss of soil fertility.

The world's human population is likely to increase to 9 billion people by 2050 and the demand on the multiple services offered by forests is likely to continue to escalate. Under business as usual, the prospects for forests, and for the people and the countless species that depend on them, are bleak. There is a risk of further erosion of the natural assets represented by forests and consequently of a further reduction in the capacity of countries to meet their development needs in a sustainable way.

management (SFM), in many cases forests continue to be managed through conventional means with single or few objectives. These often fail to manage for the multiple functions of forests and are therefore unable to adapt to, integrate or address the challenges faced by forests today.

*Need for stronger support for SFM.* SFM can capture multiple benefits in a multi-purpose approach spanning different sectors and achieving results that are greater than the sum of its parts. Under SFM, economic, ecological and social functions of forests should be taken into account and simultaneously pursued by setting a hierarchy of objectives at different spatial scales – from the landscape to the forest stand to single ecosystem components.

## Key issues

*Increasing need to manage for multiple functions.* While governance, planning and management reforms are gradually modernizing approaches to forest management towards sustainable forest

The implementation of SFM, however, requires a conducive policy and regulatory framework across sectors and institutions. SFM is often hampered by market distortions, a lack of ownership and secure forest land tenure, and governance failures.<sup>5</sup> Moreover,

SFM can only work where there is strong societal recognition of, and demand for, the multiple functions of forests and a willingness among policymakers to prioritize the long-term benefits of forests and SFM over short-term economic gains.

*Lack of full valuation of multiple forest services.* Another obstacle to the implementation of SFM is the lack of valuation of many of the goods and services provided by forests. Forests benefit societies in many ways, but generally only a few such benefits, especially the provision of wood, are paid for. The failure to internalize the full range of benefits provided by forests – such as carbon sequestration and the protection of water catchments and soils – reduces the financial competitiveness of SFM versus forest conversion or unsustainable forms of forest management.

## Experience and knowledge

*Climate-change benefits of forests.* The relationship between people, biodiversity, productivity and resilience is important in light of expected climate change. There is mounting evidence that complex and old-growth forest ecosystems continue to sequester and store high amounts of carbon, even at the climax stage.<sup>6</sup> While deforestation and forest degradation cause an estimated 17.4 percent of global greenhouse gas emissions, global carbon analyses<sup>7</sup> show that the world's existing forests are a large and persistent carbon sink; they sequestered an estimated  $2.4 \pm 0.4$  gigatonnes of carbon per year in the period 1990–2007, which was more than 7 percent of total annual greenhouse gas emissions in 2004. SFM is able to enhance the climate-mitigation functions of forests through the protection of remaining primary forests (see fact sheet 2), by enhancing carbon stocks in managed forests, and through afforestation and reforestation. Forests and SFM also

have important roles to play in the adaptation of societies to climate change (see fact sheet 8).

*Land and soil benefits of forests.* Deforestation and the desertification that can result adversely affect the productivity of the land, human and livestock health, and economic activities. Forests and tree cover prevent land degradation and desertification by stabilizing soil, reducing water and wind erosion, and maintaining water and nutrient cycling in the soil. The sustainable use of goods and services from forests and the development of agroforestry systems have the potential to contribute to poverty reduction, making the rural poor less vulnerable to the impacts of land degradation and desertification. The loss of vegetation through deforestation and the resultant land degradation and desertification cause biodiversity loss and contributes to climate change by reducing carbon sequestration.

*Livelihood benefits of forests.* An estimated 1.6 billion people use forests as sources of livelihoods and income, for example by gathering building materials, fruits, nuts, mushrooms, honey and medicinal plants, harvesting wood, grazing livestock and hunting game. Forests are also sources of genetic material for horticultural crops and trees, which can contribute significantly to household incomes. Forests and trees in rural landscapes, if managed under SFM, help to maintain productivity by stabilizing soils, reducing water and wind erosion, enhancing soil productivity, restoring degraded lands, preventing desertification and providing habitat for biodiversity. The goods and ecosystem services provided by sustainably managed forests and trees, especially in low-forest-cover countries, contribute to increased food security among the poorest and most vulnerable groups, particularly women and children (see fact sheet 3). SFM involving indigenous peoples and

local communities (see fact sheet 4) is a powerful approach for securing the livelihood benefits and cultural values of forests.

*Economic benefits of forests.* There is increasing recognition of the need to foster the role of forests and SFM in poverty eradication in developing countries.<sup>8</sup> Forests provide multiple renewable resources and can help meet growing demand for food, wood, fodder, fibre, biofuel, shelter and other products, as well as for ecosystem services. State-owned forests are also important sources of income for government. In forest-rich countries, forest industries contribute significantly to employment. The global trade in wood and wood products was worth over US\$200 billion in 2010 (the value of non-wood forest products is more difficult to quantify). Certification schemes are market-based instruments that have provided positive examples of how the productive functions of forests can be used in a sustainable way.

*Biodiversity benefits of forests.* Forests harbour an estimated three-quarters of all terrestrial plant and animal species, the majority in tropical forests (see fact sheet 6).<sup>9</sup> Biodiversity underpins most natural processes and thus the provision of forest goods and ecosystem services. Forest ecosystems tend to be naturally resilient – that is, they can recover to a given condition following a major disturbance – and there is a close relationship between ecosystem resilience and native forest biodiversity.<sup>10</sup> Resilience exists at multiple scales: in genes, species and functional groups of species, and in the processes within ecosystems.<sup>11</sup> It is the capacity for resilience that enables a continuous flow of goods and ecosystem services from a forest over time. Management approaches based on SFM that promote resilience can help ensure the maintenance of critical forest functions, in line with the seven thematic elements of SFM incorporated in all criteria and indicator frameworks.



*Targeting multiple benefits.* SFM enables the creation of synergies, at the local and national levels, between high biodiversity, carbon storage, soil and water productivity, livelihoods and other benefits provided by forests. Data on 80 forest commons in ten countries show that larger forest size and greater decision-making authority at the local level is associated with high carbon storage and livelihood benefits.<sup>12</sup> In the Brazilian Amazon, there has been less deforestation and forest degradation in protected areas (i.e. indigenous lands, strictly protected areas and sustainable-use areas) than in non-protected areas.<sup>13</sup> The SFM-based Amazon Region Protected Areas project has contributed significantly to these positive results.<sup>14</sup>

Payments for ecosystem services could support the broader application of SFM, particularly in situations where forests provide multiple services such as those associated with landscape amenity, biodiversity and water. The idea of payments for reduced emissions from deforestation and forest degradation (REDD+ – see fact sheet 5) is also emerging and taking firm shape in voluntary carbon markets. In 2010, REDD+ clearly surpassed the volume of carbon supplied by any other project type in such markets, supplying two-thirds of the carbon dioxide equivalents contracted in the primary market.<sup>15</sup>

## Challenges and opportunities

Actual and potential tradeoffs in ensuring the multiple functions of forests are numerous. They include the possible replacement of low-carbon, high-biodiversity natural habitats with high-productivity planted forests; the effects of management on downstream annual and seasonal water flows, especially in semi-arid areas; restrictions on conversion to agricultural and

pasture land; and restrictions on forest use. It is unlikely that synergies and win-win situations can be realized for all potential benefits in all cases. Societal and political choices need to be made on tradeoffs and compensation, and goals need to be prioritized. There are many complex ecological, economic and political challenges to be met in achieving SFM globally.<sup>16</sup> Nevertheless, SFM incorporates the thematic elements that sustain the functionality of forest ecosystems – embracing protected-area management, community-based forest management and industrial-scale production – and with it the sustainable flow of forest goods and ecosystem services for the benefit of all.

## What is still to be learned?

The multiple benefits of forests can best be realized through:

- The development of:
  - approaches to quantify and measure the contribution of forests to national and global economies

- mechanisms for dealing with externalities related to the use of forest ecosystem services and resources
- policies and practices that reduce inequities in access to the multiple benefits derived from forests and ensure that those who bear the costs of their provision are compensated fairly
- ways to better address cross-sectoral issues through SFM that cannot be addressed by sectors working individually
- securing forest use rights and forest land tenure for smallholders and local communities.

- Harnessing the power of international and domestic consumers so that the full range of forest products and services are increasingly derived from sustainably managed and certified forests.
- Expanding the approach of certification schemes to embrace a wider range of forest goods and ecosystem services.



## Key messages

- SFM can safeguard and, in many cases, enhance the socio-economic contributions of forests.
- The successful implementation of SFM requires enabling conditions that prioritize the long-term benefits of forests and SFM over short-term gains.
- The first steps in incorporating the multiple benefits of forests in decision-making is to recognize their full value and to establish cross-sectoral linkages.



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The Collaborative Partnership on Forests consists of 14 international organizations, bodies and convention secretariats that have substantial programmes on forests. The mission of the Collaborative Partnership on Forests is to promote sustainable management of all types of forests and to strengthen long-term political commitment to this end. The objectives of the Partnership are to support the work of the United Nations Forum on Forests and its member countries and to enhance cooperation and coordination on forest issues.

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## Endnotes

- 1 United Nations General Assembly (2008). Non-legally binding instrument on all types of forests. UN General Assembly Sixty-second Session Second Committee Agenda item 54. A/RES/62/98. 31 January 2008.
- 2 Center for International Forestry Research (CIFOR), Food and Agriculture Organization of the United Nations (FAO), International Tropical Timber Organization (ITTO), International Union for Conservation of Nature (IUCN), International Union of Forest Research Organizations (IUFRO), Convention on Biological Diversity (CBD) Secretariat, Global Environment Facility (GEF) Secretariat, United Nations Convention to Combat Desertification (UNCCD) Secretariat, United Nations Forum on Forests (UNFF) Secretariat, United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), World Agroforestry Centre (ICRAF), The World Bank.
- 3 Topics: SFM and the multiple functions of forests; SFM and primary forests; SFM, food security and livelihoods; SFM and indigenous peoples; SFM and REDD+; SFM and biodiversity; SFM and gender; SFM and adaptation to climate change. The Partnership hopes to periodically update these fact sheets and to prepare new fact sheets on other important topics, including financing.
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- 13 Soares-Filho, B., Moutinho, P. and Nepstad, D. et al. (2009). Role of Brazilian Amazon protected areas in climate change mitigation. *PNAS* 107(24): 10821–10826.
- 14 The Amazon Region Protected Areas project is funded through a US\$30 million GEF grant and more than US\$50 million of co-financing provided by the German bilateral agency KfW, the World Wildlife Fund and the Government of Brazil. More information on the project's achievements is at [www.thegef.org/gef/news/SFM\\_2011\\_IYF\\_Arpa](http://www.thegef.org/gef/news/SFM_2011_IYF_Arpa).
- 15 Diaz, D., Hamilton, K. and Johnson, E. (2011). *State of the forest carbon markets 2011*. Forest Trends, Washington, DC, USA.
- 16 Norgard, R. (2010). Ecosystem services: from eye-opening metaphor to complexity blinder. *Ecological Economics* 69: 1219–1227.