



Background document for UNFF8

**Forests and Biodiversity Conservation, including
Protected Areas and Unique Types of Forests Ecosystems**

15 February 2009

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I Introduction

The seventh session of the United Nations Forum on Forests (UNFF) adopted a Non-Legally Binding Instrument on All Types of Forests (NLBI)¹ and a new multi-year programme of work (MYPOW). The MYPOW of the UNFF scheduled “Forests in a changing environment; and Means for implementation for sustainable forest management” as the two overall themes for its eighth session (UNFF8) to be held in April 2009 in New York. Among the sub-themes is the topic of forests and biodiversity conservation, including protected areas.

The NLBI was adopted by the UN General Assembly in December 2007. Its purpose is (a) to strengthen political commitment and action at all levels to implement effectively sustainable management of all types of forests and to achieve the shared global objectives on forests; (b) to enhance the contribution of forests to the achievement of the internationally agreed development goals, including the Millennium Development Goals, in particular with respect to poverty eradication and environmental sustainability; and (c) to provide a framework for national action and international cooperation (ECOSOC Resolution 2007/40, Operational Paragraph 1). Furthermore, the NLBI stresses the need to enhance national policy coordination and international cooperation and to promote intersectoral coordination at all levels for the effective implementation of sustainable management of all types of forests (Preambular Paragraph 9).

The NLBI addresses respective issues pertaining to forest conservation and protected areas in its Global Objectives on Forests and several national and international provisions. Global Objective 1 aims at reversing the loss of forest cover worldwide through sustainable forest management (SFM), including protection, and at increasing efforts to prevent forest degradation, while in Global Objective 3 Member States commit themselves to significantly increase the areas of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from sustainably managed forests.

In this context the NLBI sets out a number of commitments in paragraphs 6 and 7 under the chapters “V. National policies and measures” and “VI. International cooperation and means of implementation². In particular, it urges Member States to consider the seven thematic elements of SFM, which are drawn from the criteria identified by existing criteria and indicators processes, as a reference framework for SFM, including forest biological diversity³. National measures also encompass to create, develop or expand, and maintain networks of protected forest areas, taking into account the importance of conserving representative forests, by means of a range of conservation mechanisms, and to assess the conditions and management effectiveness of existing protected forest areas in order to identify where improvements may be needed⁴. Adding to this, the NLBI encourages countries to support

¹ ECOSOC Resolution 2007/40. ‘Non-legally binding instrument on all types of forests’ (E/2007/INF/2/Add.2), 17 October 2007.

² The respective provisions of the NLBI are listed in Box 2, page 6.

³ Paragraph 6 (b)

⁴ Paragraphs 6 (p) and 6 (k)

education and training in order to develop resource management approaches that will reduce pressure on forests, particularly fragile ecosystems⁵.

Member States also agreed to identify and implement measures to enhance cooperation and cross-sectoral policy and programme coordination among sectors affecting, and affected by, forest policies and management, including by promoting forest conservation⁶. Furthermore, countries decided to develop and establish positive incentives, in particular for developing countries as well as countries with economies in transition, to reduce the loss of forests, to promote reforestation, afforestation and rehabilitation of degraded forests, to implement sustainable forest management and to increase the area of protected forests⁷.

This document was commissioned by the UNFF secretariat in preparation for UNFF8. Based on the respective terms of reference, this document analyzes the provisions in the NLBI and related developments as well as new emerging issues concerning forest and biodiversity conservation. It also intends to provide useful background information and discussion points for consideration in light of the topic at UNFF8.

In chapter II key figures on status and trends of forest biodiversity are summarized and key factors impacting on forest biodiversity are outlined. Consequently, chapter III analyses forest biodiversity conservation in sustainable forest management and related developments. In Chapter IV specifically the issue of protected forest areas and their management is investigated. Chapter V discusses cross-sectoral cooperation in forest biodiversity conservation. Finally, Chapter VI provides the conclusions of the analysis as well as proposals for further discussion.

⁵ Paragraph 6 (v)

⁶ Paragraph 6 (k)

⁷ Paragraph 7 (d)

II Status and Trends of Forest Biodiversity

A Key Figures on Status and Trends of Forest Biodiversity

In 2005, forests were estimated to cover 30% of the terrestrial sphere, equating nearly 4 billion hectares (ha) according to the FAO's Global Forest Resources Assessment 2005 (FRA). The majority of forest area (52%) is classified as "modified natural", while primary forests, which often have high biodiversity richness, cover 36% of the world's forest area. However, gaps in information on forest area may limit the accuracy of these estimations⁸. The Millennium Ecosystem Assessment (MEA) reports that 70% of forests can be considered as natural, 20% as semi-natural and 10% as anthropogenic⁹.

Definition of Biological Diversity, Convention on Biological Diversity 1992

Biological diversity means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Box 1: Definition of Biological Diversity

Forests are invaluable sources of structural, compositional and functional diversity from the gene to the ecosystem level, collectively containing the majority of terrestrial species¹⁰. Tropical forests are of particular importance in this regard, although they only cover approximately 10% of the terrestrial sphere. The tropical biome contains 46% of the world's forests and is home to 50% to 90% of terrestrial species. Tropical forests feature, for instance, on average about 100 native tree species per hectare. Compared to other land uses, all forests display high biodiversity richness in the context of environmental conditions. This high diversity underpins the social, ecological and economic goods and services forest ecosystems provide, including soil and water protection, food, fodder, medicine, recreation, timber, as well as spiritual and cultural values¹¹.

Globally, however biological diversity, or "biodiversity", is decreasing, at all levels, from the species to genetic, largely due to anthropogenic activities. This loss has occurred at an increasing rate, particularly over past 50 years. It is anticipated that this trend will continue or accelerate in the future¹². The MEA estimates that the extinction rate may be up to a thousand times above historical natural levels, indicating the urgent need to take more effective measures for forest biodiversity conservation.

⁸ FAO, 2006a

⁹ MEA, 2005

¹⁰ MEA, 2005; UNEP-WCMC, 2007a; CBD, 2007a

¹¹ MEA, 2005

¹² MEA, 2005

Provisions in the NLBI addressing forest biodiversity conservation

Global objectives on forests

In paragraph 5 of the NLBI Member States reaffirm the shared global objectives on forests and their commitment to work globally, regionally and nationally to achieve progress towards their achievement by 2015.

Global objective 1

Reverse the loss of forest cover worldwide through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation;

Global Objective 3

Increase significantly the area of protected forests worldwide and other areas of sustainably managed forests, as well as the proportion of forest products from sustainably managed forests;

V. National policies and measures

6(b) Consider the seven thematic elements of sustainable forest management¹³, which are drawn from the criteria identified by existing criteria and indicators processes, as a reference framework for sustainable forest management and, in this context, identify, as appropriate, specific environmental and other forest-related aspects within those elements for consideration as criteria and indicators for sustainable forest management;

6(k) Identify and implement measures to enhance cooperation and cross-sectoral policy and programme coordination among sectors affecting and affected by forest policies and management, with a view to integrating the forest sector into national decision-making processes and promoting sustainable forest management, including by addressing the underlying causes of deforestation and forest degradation, and by promoting forest conservation;

6(p) Create, develop or expand, and maintain networks of protected forest areas, taking into account the importance of conserving representative forests, by means of a range of conservation mechanisms, applied within and outside protected forest areas;

6(q) Assess the conditions and management effectiveness of existing protected forest areas with a view to identifying improvements needed;

6(v) Support education, training and extension programmes involving local and indigenous communities, forest workers and forest owners, in order to develop resource management approaches that will reduce the pressure on forests, particularly fragile ecosystems;

VI. International cooperation and means of implementation

7(d) Develop and establish positive incentives, in particular for developing countries as well as countries with economies in transition, to reduce the loss of forests, to promote reforestation, afforestation and rehabilitation of degraded forests, to implement sustainable forest management and to increase the area of protected forests;

Box 2: Provisions in the NLBI addressing forest biodiversity conservation

¹³ The elements are (a) extent of forest resources; (b) forest biological diversity; (c) forest health and vitality; (d) productive functions of forest resources; (e) protective functions of forest resources; (f) socio-economic functions of forests; and (g) legal, policy and institutional framework.

Global legally binding agreements related to the conservation of forest biodiversity

- **Convention Biological Diversity (CBD):** The objectives of the CBD are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from of the utilization of genetic resources.
- **Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES):** CITES aims at ensuring that trade in specimen of wild animals and plants does not threaten their survival. It accords varying degrees of protection to about 5.000 animal species and about 28.000 plant species listed in the CITES annexes, including forest related species.
- **Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention):** The Ramsar Convention provides a framework for national action and international cooperation for the conservation and wise use of wetlands, including forested wetlands. The CBD is cooperating with this convention in the implementation of its work programme on forests.
- **Convention on the Conservation of Migratory Species of Wild Animals (CMS, Bonn Convention):** The Bonn Convention aims to conserve terrestrial, marine and avian migratory species and their habitats throughout their range.
- **United Nations Framework Convention on Climate Change (UNFCCC):** The Kyoto Protocol and Marrakech Accords to the UNFCCC include land use, land use change and forestry activities (e.g. afforestation and reforestation) as possible measures to reduce carbon dioxide emissions and define respective mechanism and modalities. In this context environmental impacts including on ecosystems and their biodiversity are addressed.
- **United Nations Convention on Combating Desertification (UNCCD):** In the Action Programmes of the UNCCD forests provide for rehabilitation of degraded lands. The joint work-programme between UNCCD and CBD recognizes biological diversity as possible cause and consequence of desertification.
- **The International Treaty on Plant Genetic Resources for Food and Agriculture:** The objectives of the Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony with the CBD.
- **World Heritage Convention (WHC):** The primary mission of the WHC is to identify and conserve the world's cultural and natural heritage, by drawing up a list of sites whose outstanding values should be preserved for all humanity and to ensure their protection through a closer co-operation among nations.

Box 3: Global legally binding agreements related to the conservation of forest biodiversity

Due to the incompleteness of knowledge on forest biodiversity it is difficult to provide a definitive quantitative figure on species at risk of extinction due to changes in forest cover or health. The FRA 2005 reports that approximately 5% of the worlds' native tree species were in a threatened state, with rare and high value species most at risk of local extinction¹⁴.

The IUCN Red List 2008 evaluates about 3% of all described species of which 38% are classified as threatened. A very high percentage of mammals (21% of all described species)

¹⁴ FAO, 2006a

and amphibians (30% of all described species) are in a threatened state according to the IUCN criteria¹⁵.

Of all the threatened species¹⁶, 86% of avian, 86% of mammal and 88% of amphibian species are in a threatened state due to habitat destruction, in particular from loss of forests in the tropical regions. The Red List reports that 60% of the birds classified as threatened are so because of deforestation and consequently habitat destruction.

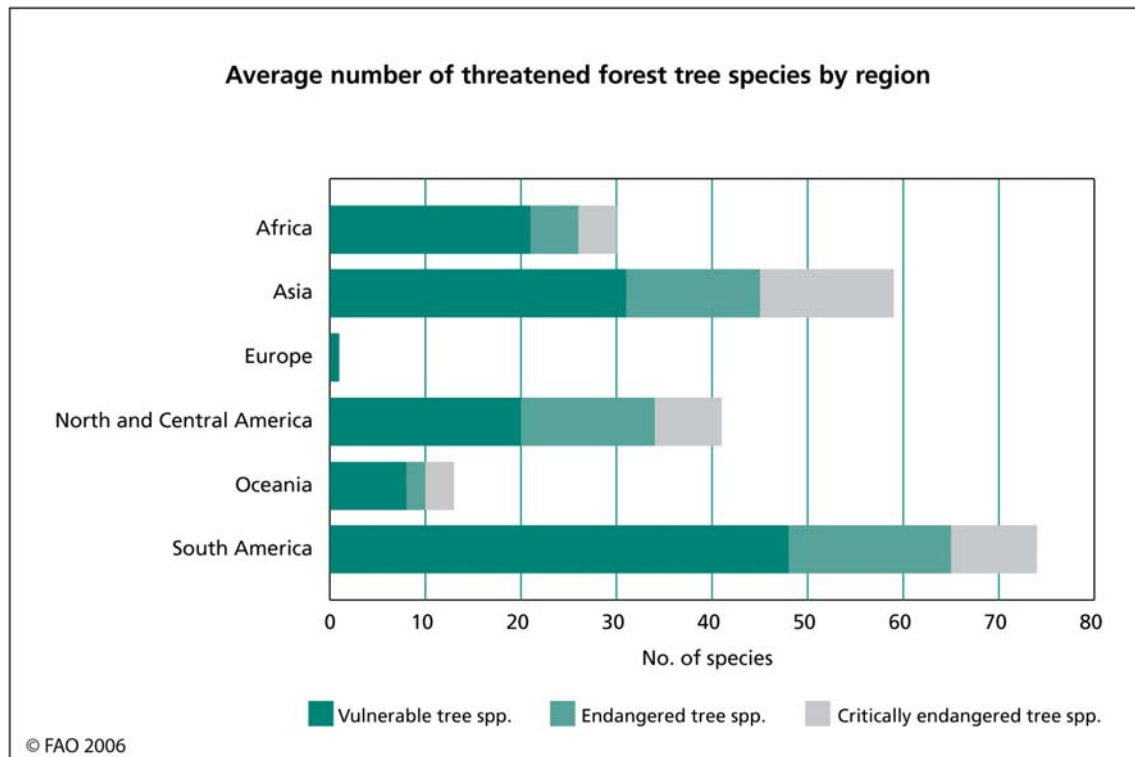


Figure 1: Average number of threatened tree species by region

This figure shows the average number of threatened forest tree species in a country by region. Threatened species are classified in vulnerable, endangered and critically endangered according to the IUCN Red list classification. Source: FAO, 2006

B Key Factors Impacting on Forest Biodiversity

The world's forest ecosystems and the biological diversity they contain are adversely impacted by deforestation and forest degradation, resulting, either directly or indirectly, from anthropogenic activities. Consequently, the loss of forest biodiversity is likely to impact ecosystem services and subsequently those who depend on them. In the following, **key factors** impacting forest biodiversity are summarized.

¹⁵ IUCN, Red List Website. www.iucnredlist.org. Accessed February 2009.

¹⁶ IUCN, 2004

Deforestation and forest land conversion constitute a major cause for global forest biodiversity loss. Deforestation largely for agricultural expansion and other land-use change and also for timber extraction is occurring at high rates. In 70% of countries investigated by the MEA, agriculture was expanding, and 66% of these countries had reported a decreasing forest cover. In the tropical regions it is expected that agriculture will continue to expand over the next 30 to 50 years¹⁷. Indirect drivers of deforestation include the socio-economic situation, particularly increases in population pressure, as well as policy and institutional failures.

As a result of deforestation, the global forest cover is estimated to have decreased at a rate of 13 million ha per year between 1990 and 2005. At the same time, forest planting, restoration, and natural expansion of forests have partly compensated for the overall loss of forest area, mainly in Europe and Asia. Between 1990 and 2000 the global net loss of forests was estimated to be 8.9 million ha per year, while between 2000 and 2005 the net loss of forest was calculated at 7.3 million ha annually¹⁸.

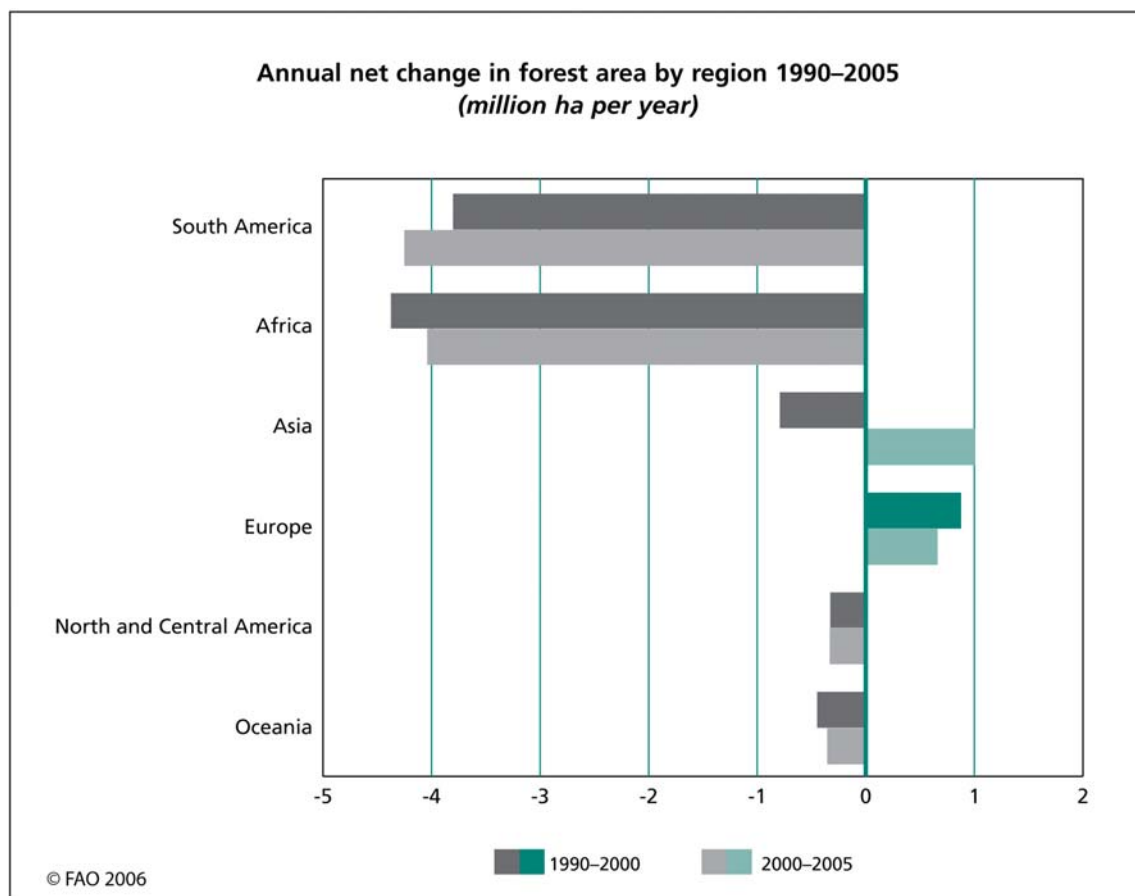


Figure 2: Annual net change in forest area. Source: FAO, 2006

¹⁷ CBD, 2007a

¹⁸ FAO 2006a

Tropical forests account for the majority of deforestation. Africa and South America¹⁹ are reported as having the most significant loss of forest cover, with an annual decrease of around 4 and 4.3 million ha, respectively, between 2000 and 2005. Furthermore, South-East Asia has also seen an increase in deforestation rates²⁰. Deforestation trends might intensify in some regions due to new and emerging issues such as land conversion for the production of bio-energy²¹ and it is anticipated that by the year 2050 ten to twenty percent of existing forested area could be converted to an alternate use, with low to medium certainty²².

In regions where deforestation is less of a concern as the area of forest cover is stable, such as the temperate and boreal zones, forest ecosystems are partly at risk of degradation and connected biodiversity loss from air pollution, fire, pests and pathogens, fragmentation and unsustainable management²³.

About 6 million ha a year of **primary forest** is lost through deforestation or modification resulting in a change in classification. An estimated 40% of remaining primary forests are at risk due to anthropogenic activities²⁴. This rate of loss is estimated to be slowing in all regions, except for South America, where the rate of loss of primary forests is increasing. In Japan and Europe, conversely, there has been an increase in primary forests resulting from natural forests having prolonged periods with no anthropogenic intervention according to FAO²⁵.

A significant problem associated with deforestation is the **fragmentation** of habitats and the 'edge effect' which further alters remnant habitats. Ultimately, fragmentation limits the capacity to maintain biodiversity, and provide ecosystem services, and leads to genetic degradation²⁶. Fragments of forests in the Amazon of 100 ha or less lose half of the bird species in a 15 year period; while for larger fragments it can take up to a century for this to occur. The time lag between disturbances, such as fragmentation, and extinction of species is important to consider when discussing restoration²⁷. Forests in Europe and some regions of South East Asia have the highest degree of fragmentation, although it is increasing in other areas, particularly in tropical forests²⁸.

Conversions of natural forests into **planted forests** may also negatively impact on forest biodiversity. Between 1990 and 2000 approximately 1.5 million ha of natural forests were converted to plantations²⁹. Forest plantations which consist of even aged-monocultures provide less favourable habitats for a range of taxa on comparison to natural forests.

¹⁹ Even though some countries in these regions have made notable progress in reducing their rate of deforestation, e.g. Brazil has achieved a reduction in forest loss of close to 25% between 2005 and 2006.

²⁰ FAO 2006a; Schmitt et al. 2008

²¹ UNEP, 2007; WWF, 2007; Hooijer et al., 2006

²² MEA, 2005

²³ MEA, 2005

²⁴ World Bank, 2007; CBD, 2007a

²⁵ FAO 2005, FAO 2006a

²⁶ MEA, 2005; CBD, 2006

²⁷ IUCN, 2004

²⁸ CBD, 2006

²⁹ FAO, 2001

Conversely, the establishment of non-industrial plantations can be utilized for maintaining biodiversity³⁰.

Through intentional and unintentional release, **alien species**, of all kingdoms, can form invasive populations, which are credited as being a major driver in loss of biodiversity, including forest biodiversity³¹. More specifically, invasive species impact on ecosystems by altering species dynamics and habitats. The rate of spread of alien species has increased correspondingly with increased human mobility associated with globalisation³². Invasive alien species show negative effects on soil quality and water availability and can cause considerable costs to national economies. As a result of climate change it is expected that the geographic distribution of invasive alien species will further expand, increasing the risk of biodiversity loss³³.

Fire is a natural part of many forest ecosystems, such as boreal and savannah ecosystems. It serves to maintain species populations, organise forest structure, and is an important aspect of the nutrient cycle. However, other forest systems are impacted detrimentally by fire, resulting in a loss of biological diversity and ecosystem services as well as leading to a degradation of forest health. Secondary impacts of fire include increased erosion, flooding, landslides and the predisposition of forests to insect and disease outbreaks³⁴.

In 2000, approximately 350 million ha of land were impacted by fire³⁵, as determined through satellite imagery, with a significant (although unquantifiable) percentage occurring in forest and woodlands. About 230 million ha of this land were located in Africa. The vast majority of fires are human induced for reasons such as agriculture, industrial development, resettlement, hunting, negligence and arson, with the biggest contributor being forest conversion for agriculture³⁶. Large scale fires are often in remote regions and caused by natural ignitions, such as lightening. In Canada, for example, 35% of fires were from natural ignition, however this equated to 85% of the area burnt, largely due to the remoteness of the fires. Similarly, the continual trend of urbanising populations is predicted to result in an increase in the area burnt, with less people present for fire prevention and suppression³⁷. Additionally, climate change is expected to result in an increase in the frequency of fire events³⁸.

The loss of forest biodiversity through anthropogenic activities, such as habitat degradation and deforestation, is anticipated to be exacerbated by **climate change**³⁹. Forests are

³⁰ MEA, 2005; FAO et al. 2001; Sedjo, 2001

³¹ FAO, 2006a; MEA, 2005; IPCC, 2007a; CBD, 2007a; GISP, 2005; Moore, 2005

³² MEA, 2005

³³ IPCC, 2007a

³⁴ FAO 2006a; MEA, 2005

³⁵ In addition, about 5,6 million ha of forested land is affected by insects and another 5,6 million ha by disease (FAO, 2006a; FAO, 2007a)

³⁶ A major problem in this respect occurs with tropical forested peatlands in South-East Asia (CDB, 2007a; WWF, 2007; Doornbosch et al., 2007; Keleş et al., 2007)

³⁷ FAO, 2007a

³⁸ IPCC, 2007a

³⁹ IPCC, 2007a

predicted to be impacted in the short term by an increase in extreme weather events and related disturbances, such as drought, fire, wind storms, insect attack, and in the long term by changes in prevailing climatic conditions, such as increase in temperature. This is prognosed to result in a loss of diversity in what are currently biodiversity hotspots⁴⁰, such as the Amazonia and tropical Africa. Boreal forests and tropical forests as well as montane cloud forests, mangroves and dry forests are most vulnerable to the impacts of climate change. Likewise, mountain forests are highly endangered as they have limited area to migrate to, and are being encroached by lowland ecosystems. At large, an upward shift in the range of forest plants, insects and animals is forecasted.

In general, climate change is expected to have an increasing impact on biodiversity over the coming century, resulting in a higher extinction rate in tropical biodiversity hotspots than deforestation, demonstrating the potential risk of climate change. This loss of biodiversity is also likely to result in a loss of the associated ecosystem services. Furthermore, the level of biodiversity contained within forests ecosystems will have implications on the impacts of climate change on the forest, as high genetic and species diversity within an ecosystem is a means of increasing the adaptive capacity of such ecosystems to climate change⁴¹.

Degradation of forest ecosystems and forest biological diversity will also have a correspondingly negative impact on the **livelihoods** and well-being of people as forests are an invaluable source of social and economic benefits. About 1.6 billion people rely to varying degrees on forests as a provider of food, fuel, building materials, medicines and other services. Approximately 300 million people are directly dependant on forests and their biodiversity for their survival⁴². In general, people having limited financial resources will be impacted most by a loss of biodiversity, and subsequently ecosystem services, as they do not have the means to purchase substitutes⁴³.

III Forest Biodiversity and Sustainable Forest Management

In Global Objective 1 of the NLBI Member States of the UNFF committed themselves to reversing the loss of forest cover worldwide through SFM, including protection, restoration, afforestation and reforestation and at increasing efforts to prevent forest degradation. Taking into account national policies, priorities, conditions and available resources, Member States agreed to consider the seven thematic elements of sustainable forest management, which are drawn from the criteria identified by existing criteria and indicators processes, as a reference framework for SFM⁴⁴. In this context the elements of SFM include forest biological diversity. The NLBI also calls for education and training in order to develop resource management approaches that will reduce pressure on forests, particularly fragile

⁴⁰ Watkiss et al. 2005

⁴¹ UNEP-WCMC, 2007

⁴² MEA, 2005

⁴³ MEA, 2005; UNEP-WCMC, 2007b

⁴⁴ NLBI A/RES/62/98, V. National policies and measures, paragraph 6 (b)

ecosystems⁴⁵. Furthermore, countries should develop and establish positive incentives, in particular for developing countries as well as countries with economies in transition, to reduce the loss of forests, to promote reforestation, afforestation and rehabilitation of degraded forests, to implement sustainable forest management and to increase the area of protected forests⁴⁶, as stated in the NLBI under international cooperation and means of implementation in paragraph 7 (d).

The paradigms of forest management experience continual change, which have resulted in the formation of broader more encompassing objectives for the forest sector⁴⁷. Over the past century forest management has evolved from sustained yield forestry to sustainable forestry and over recent decades to SFM. The NLBI refers to SFM as a dynamic and evolving concept, aimed to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations⁴⁸.

The term SFM is liberally used in different contexts. However, at the regional level countries have been agreeing on **criteria and indicators for SFM** and related definitions. All of them include the conservation of biodiversity as essential element of SFM. Approximately 150 countries are currently participating in one or more of the nine on-going processes on criteria and indicators for SFM.

International and regional processes on criteria and indicators for SFM

- International Tropical Timber Organisation (ITTO) process: tropical forests, 31 producer and 26 consumer countries
- Lepaterique process: Central America, 7 participating countries
- Tarapoto proposal: Amazon forest, 8 participating countries
- African Timber Organization (ATO) process: 13 participating countries
- Dry zone Africa process: 28 participating countries
- Dry forest in Asia process: 9 participating countries
- Near East process: 30 participating countries
- Montreal process: Temperate and boreal forests outside Europe, 12 participating countries
- Ministerial Conference on the Protection of Forests in Europe (MCPFE) process: 46 participating countries

Box 4: International and regional processes on criteria and indicators for SFM

⁴⁵ National policies and measures, paragraph 6 (v)

⁴⁶ NLBI A/RES/62/98, VI. International cooperation and means of implementation, paragraph 7 (d)

⁴⁷ IUCN, 2005

⁴⁸ NLBI A/RES/62/98, III. Scope, paragraph 4

A Status and Trends of Sustainable Forest Management

Monitoring, assessment and reporting on progress toward SFM is guided by a framework of seven thematic elements, as adopted by the fourth session of the UNFF, in resolution 4/3, on basis of international and regional criteria and indicators processes, namely⁴⁹:

- extent of forest resources;
- biological diversity;
- forest health and vitality;
- productive functions of forest resources;
- protective functions of forest resources;
- socio-economic functions;
- legal, policy and institutional framework.

Through analysis of global trends associated with each of the above mentioned groups, it is possible to get an overview of the existing situation concerning SFM:

Status and trends of SFM by thematic areas

Extent of forest resources

In 2005 there were nearly 4 billion ha of forests in the world, covering about 30% of the world's land area. Forests are unevenly distributed, 64 countries have forest area of less than 10%. The trend of deforestation is already described in chapter II. The forest area decreased at a rate of 0.2% per year on average between 1990 and 2005, equating to 20,000 ha per day⁵⁰. However, the net rate of loss declined slightly. Carbon stocks in forest biomass decreased by about 5.5% globally.

Biological diversity

The trends of biodiversity related figures are already outlined in detail in chapter II. As many interrelated variables serve as indicators for biodiversity it is difficult to clearly identify trends in the conservation of biodiversity in SFM. Between 1990 and 2005 there was an increase of 32% in the area of forests designated for conservation. However, there was a reduction in 1.3 billion ha of primary forest, containing high levels of biological diversity, at a rate of 6 million ha a year through clearing or modification. In summary the increase of forests designated for conservation of biodiversity is positive, whereas the continuing decline of primary forests is a matter of concern. It is still difficult to provide quantitative figures on changes in species diversity in forests, but related baselines will further facilitate the identification of trends⁵¹.

Forest health and vitality

The area of forest adversely affected by insects, disease and other disturbances shows an increase equivalent to 1.1 million ha per year, while the area adversely affected by forest fires shows a small decrease. In 2005, an average of 1.4% forests in countries were affected by insects, and the same

⁴⁹ FAO, 2007b

⁵⁰ FAO, 2007b

⁵¹ FAO, 2006a; FAO, 2007b

percent again was affected by diseases, while 0.9% were affected by fire. However, these figures are drawn from the information provided by 20 countries, mostly in Europe. Other figures state that 350 million ha a year is affected by wildfire (including non-forest land), equating to approximately 5% of the world's forest area per year. 80% of wildfires have anthropogenic ignitions. In general, information on indicators related to forest health is missing from many countries, particularly from Africa⁵².

Productive functions of forest resources

Approximately 50% of the world's forests have timber production as one of the objectives. 32% of the world's forests have the primary objective of timber production. The area designated, however, declined between 1990 and 2005 by 5%. At the same time areas designated for conservation increased by roughly the same amount, which might reflect a subtle change in global perceptions of forest values. Plantations constitute 140 million ha of the world's forests, increasing by 2.8 million ha between 2000 and 2005⁵³.

⁵² FAO, 2007a; FAO, 2007b, CBD, 2007a

⁵³ FAO, 2006a; FAO, 2007a; FAO, 2007b

Protective functions of forest resources

An estimated 348 million ha of forests have protective functions as the primary objective, equating to 9% of the world's forests, and marking an increase in area of 1% between 1990 and 2005. However, this figure seems to clearly under-represent the extent of forests performing protective functions⁵⁴.

Socio-economic functions

In 2005 US\$ 64 billion worth of roundwood was harvested, indicating an 11% increase between 1990 and 2005. Countries in Africa, Asia and the Pacific, and Latin America and the Caribbean primarily utilise primary forest products, such as roundwood and fuelwood, while countries in the more developed regions tend to use more wood processing industries, such as pulp and paper. Asia and the Pacific has remained a net importer of forest products between 1990 and 2004, while North America, traditionally an exporter, and also has become a net importer, and Europe has become a net exporter of forest products⁵⁵. Approximately 10 million people were employed in the forest sector in 2005, a 10% decrease from 1990. Social values of forests are gaining more importance, with 4% of the world's forests being managed primarily for recreation, education, tourism or for another social value.

Legal, policy and institutional framework

Since 1990 more than 100 countries have developed national forest programmes promoting sustainable management of forests. There is a global trend for management of forests to shift from national to local levels, and in some regions moves away from public forests toward privatisation, such as in Eastern Europe⁵⁶.

Box 5: Status and trends of SFM by thematic areas

Tropical Forests

As tropical forests play such an important role in global forest biodiversity conservation the respective information regarding the tropical forest biome is of high significance. According to the ITTO⁵⁷ SFM is defined as *“the process of managing permanent forest land to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction in its inherent values and future productivity and without undue undesirable effects on the physical and social environment”*.

Under this definition about 36.4 million ha (4.2%) of tropical forests from ITTO member countries (33 countries, with 859 million ha of forest) are managed sustainably. This equates to approximately 6 million of 110.5 million ha of forests in Africa, 19.5 million of 206.7 million ha of the forests in Asia and the Pacific, and 10.8 million ha of 541.6 million ha of forests in Latin America and the Caribbean. The ITTO identifies an increasing awareness and commitment to SFM from governments since 1988, with an improvement in legislation, administration arrangements and consultative processes, resulting in an increase in the area

⁵⁴ FAO, 2006a; FAO, 2007a

⁵⁵ FAO, 2007b

⁵⁶ FAO, 2007b

⁵⁷ ITTO, 2006a

of sustainably managed tropical forests⁵⁸. Nevertheless, the low percentage of tropical forests formally under SFM indicates that major efforts also at global level are needed to further implement the concept of SFM in order to substantially reduce deforestation and the loss of biological diversity.

Forest Certification

Information on certified forests and forest products is another approach of assessing SFM. However, it is noted that certification systems provide information on market trends and respective information is also a measurement of the awareness about sustainable production, and is not accurate at indicating progress toward sustainability in general⁵⁹.

By June 2007 approximately 306.3 million ha (8%) of forest have been certified, with 65% under PEFC, 28% under FSC and 7% under national certification systems. This marks more than a double in the area of forests under certification since 2002, although the increase has started to reduce, and in 2007 was at 10% per year. The vast majority of certified forests were located in developed countries, with developing countries containing 7% of the certified forest, yet producing 27.4% of the world's industrial roundwood⁶⁰.

B Recent Developments, Challenges and Achievements Regarding Forest Biodiversity Conservation in SFM

Knowledge about forests and their biodiversity is growing. Likewise, society's expectations of both forest management and the conservation of biodiversity are evolving. In addition, the physical environment doesn't stay the same. Climate change, for example, is likely to have serious impacts on forests. The consequence is that SFM will need to be much more adaptive in the future and integrate measures linked to new emerging policy goals.

Biological diversity is a public good and ultimately, the question of what to conserve, at what cost, is a decision for societies. Different societies with differing cultural values and at differing stages of economic and social development will inevitably make different choices on their biodiversity conservation strategies and priorities.

At global and regional levels the paradigm of SFM has been incorporated into a number of international and regional agreements. Principles and broadly-accepted criteria and indicators for SFM have been established. The NLBI sets a global standard in forest management and while the instrument is non-legally binding, it is a politically binding obligation. It provides a comprehensive basis to strengthen political commitments and action at all levels to implement global sustainable management of all types of forests. In addition, the instrument promotes a participatory approach and active civil society involvement in its implementation.

⁵⁸ ITTO, 2006a

⁵⁹ CBD, 2006

⁶⁰ ITTO, 2008

In parallel there has been already a strong tendency towards more participatory, localized decision-making based on a re-examination of who makes decisions about forests and how these decisions are made. Political pressures, the media and activism by civil society groups have been major drivers of change⁶¹.

Efforts to implement SFM need to consider numerous ecological interactions. Timber harvesting in production forests inevitably influences biodiversity; ideally the impacts will be recognized and accepted by stakeholders. Trade-offs between economic costs and benefits on the one hand and biodiversity gains and losses on the other need to be discussed and acknowledged explicitly and the selection of alternative strategies and scenarios negotiated between stakeholders⁶².

Many countries have revised their forest and forestry laws in the past decade; in most cases, the new laws give greater attention to biodiversity conservation. Very often, forest management plans now routinely address biodiversity conservation, an indication that the policy work of intergovernmental agreements, organizations and processes as well as initiatives of civil society organizations are having an effect⁶³.

1) **Key Challenges**

Key challenges regarding forest conservation in the context of SFM are to meet the globally increasing demand for wood and for forest ecosystem services, to sustain livelihoods and support poverty alleviation, to establish good governance structures, secure land tenure rights and prevent illegal activities, to maintain biodiversity conservation in climate change mitigation measures and to tackle biodiversity issues connected to plantations and the use of genetically modified trees. Overall, SFM needs to stay economically viable, bearing in mind the financing of conservation measures.

Costs and Benefits

Biodiversity is a public good; ultimately, the public needs to consider ways and means to pay the cost of its conservation. Currently, however, many of the beneficiaries of biodiversity conservation pay little for it. This is a major concern for those managing the forest and those contributing to the conservation of biodiversity as they must meet additional costs in order to provide environmental services for the public good.

In this context, SFM still faces serious problems inhibiting its expansion in some regions. For example, the ITTO reports that in many regions of its member countries SFM is less profitable than other land-uses and that many of the forests which are currently managed

⁶¹ IUCN, 2005

⁶² ITTO/IUCN, 2008

⁶³ ITTO/IUCN, 2008

under the SFM principles have achieved this through external financial and technical support⁶⁴.

The concept of incremental costs can be used to estimate the amount of financial support needed to meet the additional cost of providing global environmental benefits including the costs of forest biodiversity conservation. Applied to forest management, such costs are a measure of the amount that timber producers must pay, over and above business as usual, to implement specific biodiversity conservation measures⁶⁵.

Nevertheless, an accurate estimation of incremental costs relies on baselines, which for forest biodiversity would be the cost of forest management that does not include additional biodiversity conservation measures. However, the choice of these baselines, respectively standards for forest management, is controversial. They depend on expectations of society and the valuing system chosen and need to be agreed on a broad basis.

Timber Demands and Sources

The global demand for timber between 1990 and 2005 has shown little indication of change, with 3,041 million m³ of wood removed in 1990 compared to estimated 3,100 million m³ in 2005, including industrial roundwood and fuelwood⁶⁶. However, over the next 30 years it is expected that there will be an increase in the consumption of the main timber products (roundwood, sawnwood, pulp, paper)⁶⁷. It is also expected that there will be a shift in the source of timber from temperate to tropical regions, and from the Northern to the Southern Hemisphere⁶⁸.

Similarly, by 2050 it is predicted that the demand for industrial roundwood will increase by 50% to 75%, resulting in the expansion of plantations⁶⁹. An increase in the percentage of timber harvested from plantations from 20% in 2000, to 40% by 2030 is also anticipated⁷⁰. Plantation expansion often with few species, such as that seen in tropical regions where the area of plantations doubled between 1995 and 2005, may impact on forest resilience⁷¹.

Due to the recent developments in environmental and energy policies, it is predicted that there will be a three fold increase in the demand for biofuels by 2030; an increase is expected both in developed and developing countries. This increase in the demand for biofuels may result in changes in forest management, and the sources of woody biomass move from utilizing harvesting residuals to direct removals and plantations. Therefore, an increase in the use of biofuels may contribute to deforestation, forest degradation and loss of

⁶⁴ ITTO, 2006a

⁶⁵ ITTO/IUCN, 2008

⁶⁶ FAO, 2006a

⁶⁷ CBD, 2007a

⁶⁸ IPCC, 2007a

⁶⁹ CBD, 2007^c; Sedjo, 2001

⁷⁰ IPCC, 2007a

⁷¹ CBD, 2007a

biological diversity, if adequate policies are not introduced to avoid negative impacts⁷² (see detailed analysis in chapter III C).

The conflicting interests between an increasing demand for wood as a consequence of promoting the use of energy from renewable resources and biodiversity protection measures are evident. A respective study, outlining limitations in the supply of forest goods and services set by conservation activities concludes that the potential wood supply from European forests is reduced by about 68 million m³ due to forest biodiversity conservation regimes⁷³.

Livelihoods and poverty alleviation

Forests and the services they provide are an invaluable source of social and economic benefits to humans. Approximately 300 million people are directly dependant on forests and their biodiversity as a provider of food, fuel, building materials, medicines and other services needed for survival. This includes approximately 60 million indigenous people who are highly dependant on forests⁷⁴. In Africa, 90% of the wood removals are used for energy production, largely for cooking and heating⁷⁵.

Globally, roundwood worth US\$ 64 billion has been harvested in 2005, indicating an increase of 11% since 1990. A further US\$ 4.7 billion of NWFP were generated in 2005, however it is reported that this figure has high uncertainty as baseline information is lacking in quality and quantity. According to some estimates the value of NWFP is even considerably exceeding the value of wood. Additionally, forestry employs an estimated 10 million people worldwide⁷⁶.

In general, forests play a key role in the economy of many countries⁷⁷. Urban areas often depend on forested areas for their water supply and benefit from the multiple environmental services of urban forests and trees⁷⁸. Non-timber forest products (NTFPs) and forest ecosystem services including biodiversity are crucial for many societies. In particular, medicinal plants, food plants, clean water, rattan, bushmeat and bamboo have an important yet often underrepresented (i.e. in development strategies or in national data bases and statistics)⁷⁹ role for rural livelihoods and local and national economies⁸⁰. The provision of non-timber forest products is often dependent on intact forest ecosystems with high biodiversity, for example for the use of medicinal plants or sustaining productive fisheries from forested wetlands⁸¹.

⁷² FAO, 2007b

⁷³ Verkerk et al., 2008

⁷⁴ MEA, 2005; CBD, 2007a

⁷⁵ FAO, 2007b

⁷⁶ FAO, 2006a

⁷⁷ MEA, 2005; World Bank, 2003

⁷⁸ FAO, 2007b

⁷⁹ The 2007 State of the World's Forests concludes that "decision-makers will continue to underestimate the importance of forestry to social and economic development as long as the sector fails to quantify the full extent of its contributions, including those from fuelwood, NWFPs and environmental services." (FAO, 2007b, p. 78)

⁸⁰ FAO, 2006a; Kalisch, 2001

⁸¹ Mgdeoji, 2007

Forests also play a crucial role in relation to the conservation, storage and quality of potable water. About 57% of the world's freshwater stems from forested areas, which, when coupled with the supply from mountain ecosystems (28% of freshwater), supplies an estimated 4 billion people with freshwater, or two thirds of the world's population⁸². Despite this importance 42% of the world's main river basins have undergone substantial deforestation, with 75% of their original forest cover lost⁸³. However, the sustained provision of water for urban supply is a major driver of the restoration of forests and establishment of protected forests.

The right of local populations to benefit from the biodiversity on their traditional lands has been the subject of international debate in the context of the CBD and its Cartagena Protocol as well as other international fora. The idea of paying local communities and individuals for ecosystem services provided by forests – including biodiversity conservation – has been widely discussed. There have been efforts to recognize the intellectual property associated with local and Indigenous knowledge about biodiversity, although mechanisms to formalize such recognition have proved elusive⁸⁴. In general, conflicting interests between indigenous and local communities and forest management need to be addressed in order to secure SFM and biodiversity conservation (see also chapter IV B).

Governance, land tenure rights, illegal harvesting and trade

Globally there is a trend of transferring land rights from state control and ownership to local communities and to individual households, although 84% of forests and 90% of wooded lands are currently publicly owned. Privatization of forest resources is globally wide spread, although varying between continents. In Africa, private forests are rare, while 56% of forests in Central America and 29% of North America, and in Europe 51% are privately owned (excluding the Russian Federation)⁸⁵.

In regions where there is a lacking in long-term government resolve and consequently insecure land tenure it is less likely that SFM would be implemented. As designated land-uses are not guaranteed for the long-term, thus utilizing resources for SFM on forests which may be allocated for non-forest land-use in the future would be a futile exercise⁸⁶. Also in these regions uncontrolled harvesting activities and subsequent forest degradation is prevalent due to unresolved land tenure and access-rights issues⁸⁷. Efforts for sustainable forest management are being undermined through illegal harvesting of timber and other forest goods. This is most prevalent in tropical countries⁸⁸. These illegal activities are mostly detrimental to forest biodiversity conservation⁸⁹.

⁸² MEA, 2005; UNEP-WCMC, 2007b

⁸³ MEA, 2005

⁸⁴ ITTO/IUCN, 2008

⁸⁵ FAO, 2006a; FAO, 2007b

⁸⁶ ITTO, 2006a

⁸⁷ Koo Lee, 2007

⁸⁸ MEA, 2005

⁸⁹ UNEP, 2007

The underlying causes of illegal harvesting are complex and often lie outside the forestry sector. Illegal activities may be poverty driven or associated with commercial exploitation, sometime associated with armed conflicts, but they are always connected to weak governance, including inadequate policies and legislation, weak institutional structures, and inability to monitor and enforce regulations⁹⁰.

Although figures on illegal harvesting are not common in national reports, in 2006 the World Bank reported that US\$ 10 billion of revenue is lost each year from illegal logging and US\$ 5 billion in lost taxes and royalties⁹¹. According to the CBD other estimations suggest that governments lose US\$ 15 billion a year in royalties and taxes due to illegal logging, mostly in developing countries⁹².

Biodiversity is also significantly impacted by trade, particularly illegal trade and trade in endangered species. Even legal trade, including trade liberalization, may not necessarily be supportive of biodiversity conservation and sustainable use at the national and international levels⁹³. Recent estimates suggest that up to 15% of internationally traded roundwood might originate from illegal timber sources⁹⁴.

Several regional intergovernmental initiatives on Forest Law Enforcement and Governance (FLEG initiatives) are addressing these issues aiming at contributing to progress towards sustainable forest management. The FLEGT (Forest Law Enforcement, Governance and Trade) initiative of the European Union also includes trade issues and recognizes the joint responsibility of producer and consumer countries through their voluntary partnership agreements. In the context of tropical forests, ITTO established the *Programme on Tropical Forest Law Enforcement and Trade* (TFLET) which aims at improving forest law enforcement and governance in ITTO member countries in order to promote international trade in tropical timber from sustainably managed forests and to help alleviate poverty in these countries. In addition the World Bank is facilitating the ENA-FLEGT process in Asia and Europe.

However, governance, land tenure and the enforcement of forest related laws fall strictly in the sovereignty of states and are sensitive issues for many governments. Therefore, their willingness to discuss them at international level is rather limited. In addition, many countries consider forest and environment related policy fora as not adequate to address trade issues.

Climate change

The anticipated impacts of climate change on forest biodiversity are outlined in chapter II. In addition, climate change and climate change response policies are affecting the conditions for biodiversity conservation in SFM. Climate change is expected to aggravate problems related to forest health, and to impair key ecosystem services of forests, such as their ability to improve and protect soil and to clean and store water. Possible benefits of accelerated

⁹⁰ World Bank, 2006b

⁹¹ World Bank, 2006a

⁹² CBD, 2007a

⁹³ ITTO statement at the webforum "Forests and Biodiversity Conservation, including Protected Areas" hosted by the UNFF secretariat at esaconf.un.org/WB/default.asp?action=10&boardid=46&fid=667 in June 2008

⁹⁴ Brack et al., 2002; Contreras-Hermosilla et al., 2007

forest growth due to increased carbon-dioxide concentrations and warmer temperatures are expected to be outweighed by negative impacts such as droughts and other natural disturbances. Air and water pollution will presumably have a larger impact on forest ecosystems as their resilience is decreasing due to climate change⁹⁵. As a consequence, the adaptation of forests, to the expected and unexpected effects of climate change, needs to be included as an additional policy goal in the existing SFM concept framework.

The narrow focus of the UNFCCC on carbon values and the fragmented treatment of forests in its deliberations, including the proposed measures on reducing emissions from deforestation and degradation (REDD) have implications for SFM and biodiversity conservation. The potential of REDD to deliver multiple ecosystem benefits and services is well documented. However, there are potential risks for missing conservation goals and negatively impacting on livelihoods as decisions under the UNFCCC focus on the reduction of emissions and not necessarily on maximising other benefits. Biodiversity plays a key role in enabling adaptation of forests to climate change and REDD policies and measures will need to take into account all environmental services of forests in order to support SFM and to generate co-benefits for biodiversity conservation. Key attributes of SFM, such as good governance, recognition of rights and tenure of forest dependent communities and balanced provision of goods and services can be considered fundamental prerequisites of sustained land-use based emission reductions.

There is risk that emerging markets for carbon sequestration and biomass could encourage afforestation and reforestation based on large scale forestry schemes, which focus on simple forest types and land with good growth rates. While planting trees on formerly forested land can enhance biodiversity and environmental services, especially when native species are used, the establishment of single species plantations may decrease biological diversity and landscape diversity and degrade soils⁹⁶. The focus on carbon sequestration or biomass production might also trigger an increased use of alien or genetically modified species to improve growth rates. If severe degradation hampers the regeneration of native species, the establishment of non-invasive exotic species as a nurse crop may be useful in restoration of natural forest ecosystems in order to assist in the recovery of key primary processes such as nutrient cycling. Nevertheless, using alien invasive species for forest establishment may adversely affect environmental services and create negative side effects. In addition, the use of genetically modified species entails risks of genetic pollution and other negative environmental impacts⁹⁷, while genetic diversity is seen as important factor for adapting to climate change⁹⁸.

Another issue might be an increased application of chemicals in controlling pest populations in order to retain biomass for carbon sequestration, which may also affect populations of non-target species negatively and bears the risk to pollute air, soil and groundwater. The use

⁹⁵ IPCC, 2007a; MEA, 2005

⁹⁶ In addition, planting trees on natural non-forest ecosystems is likely to lead to loss of native flora and fauna and associated ecosystem services.

⁹⁷ See below

⁹⁸ MCPFE, 2006

of fertilisers to increase forest growth rates and hasten the accumulation of woody biomass may cause eutrophication leading to a loss of local biodiversity. Fertilisers may also contribute to greenhouse gas emissions through enhancing nitrogen oxide emissions and decreasing methane oxidation. Furthermore, harvesting techniques that extract all above ground biomass of trees for energy production might seriously diminish the nutrient flow causing a degradation of sites⁹⁹.

The loss of tropical peatlands and thus key carbon-storage facilities is currently exacerbated by agricultural expansion, in particular due to the growing demand for biofuels (see also chapter III C). Peatlands, much of which are forested, cover only 3% to 4% of the world's terrestrial surface, but they store twice the carbon of all the world's forests combined¹⁰⁰. Yet, through land conversion and peatland degradation, their biodiversity is increasingly being lost, and carbon dioxide is emitted in large quantities every year, which contribute up to 10% of global annual greenhouse gas emissions¹⁰¹.

The CBD addresses the need for synergies in the implementation of the UNFCCC and the CBD and stresses that carbon sequestration activities should be conducted in accordance with sustainable use and conservation of biological diversity. Moreover the potential impact of afforestation and reforestation on forest biological diversity and other ecosystems should be taken into account. In addition, CBD signatories committed themselves to address the impacts of the production and use of biomass for energy on forest biodiversity. In decision IX/16 the COP, inter alia, calls for collaboration of the Rio Conventions and the CPF, invites the UNFCCC to take full account of the application of the ecosystem approach and SFM, stresses the integration of biodiversity, climate change and land degradation issues in forest sector planning and the involvement of UNFF focal points and other relevant forest related conventions in relevant climate change response issues.

The Kyoto Protocol and the Marrakech Accords refer to the importance of ensuring that climate change mitigation activities contribute to the objectives of the CBD, but so far UNFCCC related provisions do not explicitly exclude practices potentially negatively impacting on ecosystem integrity and the provision of goods and services as well as practices leading to loss of native biodiversity¹⁰².

Plantations

Due to climate change response activities outlined and an increased economic efficiency driven by economic integration and the reduction of trade barriers a far higher proportion of world's timber now originates from planted forests. Their contribution to global wood production is approaching 50 % of the total and the area of planted forests is increasing as well¹⁰³. Planted forests might help reduce logging pressure on primary and natural forests providing a sustainable source of timber, but can also cause losses of biodiversity when

⁹⁹ MCPFE, 2006

¹⁰⁰ MEA, 2005; Stern, 2006; Keleş et al., 2007

¹⁰¹ Hooijer et al., 2006

¹⁰² MCPFE, 2006

¹⁰³ FAO, 2007b

replacing natural forests¹⁰⁴. However, other sources suggest that the expansion of plantations may not succeed in lowering the demand for timber from natural forests, as the increased efficiency of plantations lowers the price of timber, thus stimulating more demand¹⁰⁵.

As stated earlier, the narrow focus on carbon sequestration or biomass production (especially valuing these functions over other ecosystem services activities) in plantations in the context of the UNFCCC may conflict with a balanced approach to SFM and sustainable development and may cause negative impacts on the environment including biodiversity and livelihoods. Certain afforestation activities may be effective in storing carbon or contributing to the reduction of greenhouse gas (GHG) emissions, but might not comply with the principles of sustainable development. In the context of tropical forests ITTO developed guidelines for the establishment and sustainable management of planted tropical forests.

Genetically Modified Trees

Recently in scientific fora and policy processes an intense discussion evolved on advantages and disadvantages of genetically modified trees (GMTs). Much uncertainty on the use of GMTs exists and scientific data is currently not available to assess its potential impacts. The research on the development of GMTs has outpaced the research on the potential impacts of such technologies¹⁰⁶.

GMTs offer multiple benefits, although their use also carries inherent risk. Developments of GMTs have focused on alterations to the lignin content, increasing resistance to insects, creating herbicide resistant trees, and increasing trees resiliencies to stresses. Such measures are hypothesised to increase the efficiency of forest sector, by producing timber that is better suited to different uses (e.g. pulping or construction) and increase the health of forests. However, GMTs have associated risks, and have the potential to impact on wild populations and different components of ecosystems and their biological diversity. A major concern with GMTs is cross pollination and hybridisation with wild populations of tree species. This can occur through GMTs reproducing with wild populations and possibly via bacterial vectors transferring transgenic genes. The formation of wild populations of highly competitive GMTs has the capacity to strongly impact on ecosystem diversity and becoming invasive species. Another concern is that insect resistant GMTs may effect also non-target insect populations of forest ecosystems and consequently negatively impact on decompositions processes, soil structure and species diversity. Over all there is a high degree of uncertainty associated with the long term environmental impacts of GMTs, and much of the existing information is hypothetical¹⁰⁷.

In this context, the Conference of Parties to the CBD recently came to the decision (IX/5) that, inter alia, the precautionary approach should be applied when considering the use of GMTs and the release of GMTs should be only authorized after completion of studies

¹⁰⁴ CBD, 2006

¹⁰⁵ IUCN/WWF, 2006

¹⁰⁶ Farnum et al., 2007

¹⁰⁷ CBD, 2007a; CBD, 2007c, CBD, 2008a

including comprehensive risk assessments. The Cartagena Protocol is establishing an Ad-Hoc Working Group on Risk Assessment and Risk Management addressing also GMTs. Some countries already defined guidelines and regulations for the use of GMTs.

2) **Recent management approaches addressing forest biodiversity conservation**

In addition to the Criteria and Indicators for Sustainable Management established by regional processes (see box 4) other management tools aiming at enhancing the conservation of biological diversity in production forests have been developed.

Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forests

The ITTO in cooperation with IUCN recently revised its **Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forests**.

Objectives of the ITTO/IUCN guidelines

The guidelines aim to promote the conservation of native animal and plant species in tropical production forests. Specifically, they aim to promote:

- an enhanced role for tropical production forests as components of multi-functional landscapes that contribute to native biodiversity conservation at different spatial scales;
- the equitable distribution of the costs and benefits of biodiversity conservation in tropical production forests;
- an improved understanding of the impacts of forest management on biodiversity;
- the adaptation of forest management practices at all spatial scales to favour the conservation of native biodiversity;
- improved ecological processes in tropical production forests provided by the presence of locally adapted native biodiversity; and
- improved practical forest management at all spatial scales aimed at retaining native biodiversity.

Box 6: Objectives of the ITTO/IUCN guidelines

The Guidelines are designed to assist policy makers and forest managers in their decisions and distinguish two levels of intervention, one level being general approaches to forest management to be adopted universally, the other level focusing on practical experience and providing advice for designing locally applicable guidelines and silvicultural practices.

The updated Guidelines take into account new developments in conservation and sustainable management and have been tested in the field before being released. The overall conclusion from the testing is that there is broad agreement on the goals of the Guidelines, including the potential value of production forests in meeting biodiversity conservation targets. However, the need for technical and financial assistance has been articulated to help forest managers to implement the Guidelines. In this context, the

Guidelines also propose a classification of the incremental costs of biodiversity conservation in SFM within key categories. Such a classification serves two purposes: making the Guidelines easier to understand from the point of view of their implementation costs; and helping to design effective incentives.

One of the most important messages in these Guidelines is that forest managers must be capable of monitoring changes in both biodiversity and society's requirements for biodiversity and of adapting their management practices accordingly.

Forest Landscape Restoration

Human activities and land-use practices at landscape level are degrading and homogenizing forests worldwide. Forest biodiversity conservation strategies in many cases need to consider the whole forest landscape. A landscape can be defined as a cluster of interacting ecosystem types, and also as a mosaic of land-cover types and their institutional and cultural context. Landscape ecology, the understanding the ecological consequences of management at landscape scales, can provide guidance on the implications for biodiversity conservation of different landscape-scale management options¹⁰⁸.

In response to this, the concept of **Forest Landscape Restoration (FLR)** aims to balance the ecological benefits with the social requirements. FLR, coined in 2001, is "a process that aims to regain ecological integrity and enhance human well-being in deforested or degraded forest landscapes"¹⁰⁹. Forest restoration activities often only consist of reforestation in deforested and degraded landscapes with fast growing exotic tree species. However, in most cases these approaches are not achieving the benefits in human-wellbeing that were anticipated, as they rather focus on industrial timber production but do not accommodate the traditional needs of communities. Experiences show that actions in national resource management which fail to account for the interests and needs of people are unlikely to succeed¹¹⁰.

FLR brings stakeholder groups together to identify, negotiate and implement practices that restore an optimal balance among the ecological, social, cultural and economic benefits of forests, within the broader pattern of land uses. The goal is to adopt holistic approaches that restore the functions of forests and enhance their contribution to sustainable development¹¹¹.

More than 25 countries and organisations around the world have formed a growing network called the Global Partnership on Forest Landscape Restoration. It was initiated in 2003 to aid in the exchange of experiences and to identify, undertake and support forest landscape restoration activities as well as to fulfil international commitments on forests¹¹². In this context

¹⁰⁸ ITTO/IUCN, 2008

¹⁰⁹ Lamb et al., 2003

¹¹⁰ Lamb et al., 2003

¹¹¹ FAO, 2007b

¹¹² UNFF, 2005

a manual on restoring forest landscapes has been developed by ITTO in cooperation with IUCN to clarify the concepts and strategies associated with FLR. Efforts in FLR have also aided in expanding the forest cover, counter balancing some of the forests which were converted to alternative land-uses¹¹³.

C Biofuel Production and Forest Biodiversity

Biofuels have been proposed as a solution to the global concerns of energy security and climate change as well as an opportunity for sustainable rural development and are an urgent issue at the political agenda intensively discussed in various policy developing processes at different levels. While being another challenge for sustainable forest management (aspects of biomass production have been already discussed in the respective chapter III B), the complexity of the topic and its global significance for sustainable development in all major sectors suggest a further analysis in a broader context in this chapter.

The term “biofuel” usually refers to any fuel derived from biomass, such as alcohols, biogas, vegetable oil and fuelwood, which can be used to replace fossil fuels. At the moment, the most common biomass sources for biofuels are agricultural crops, however, it has been forecasted that a greater amount of lignocellulose materials (so called second generation feedstock)¹¹⁴, including woody biomass (woody plants, residues from forestry sector) will be used for biofuel production. According to FAO, biofuel technologies as well as policies are evolving at a rapid pace and it is expected that technology will be available in the medium term for commercially competitive production of biofuels from woody biomass¹¹⁵. At present, wood energy is most competitive when produced as by-product of the wood processing industry. Wood residues from felling and processing constitute more than half of the total biomass removed from forests¹¹⁶.

In general, bioenergy, including from woody biomass, constitutes already a large proportion of current supply from renewable sources of energy¹¹⁷. On one hand biofuels can be a renewable source of energy, substituting fossil fuels and reducing greenhouse gas emissions as well as enhancing economic opportunities for rural communities. On the other hand, the production of biomass for biofuels may adversely impact biodiversity, the provision of benefits from ecosystem services and livelihoods of local people. The dominant factors determining the environmental and biodiversity impacts of biofuels are the types of lands used for producing biofuel feedstock and the feedstock production practices employed, including the plant species used. Depending on the feedstock, where and how it is grown, and the manner in which it is processed, the greenhouse gas balance, energy yields and environmental impacts of biofuels may differ considerably¹¹⁸.

¹¹³ FAO, 2006a

¹¹⁴ CBD, 2008b

¹¹⁵ FAO, 2008

¹¹⁶ FAO, 2008

¹¹⁷ FAO, 2008

¹¹⁸ The Royal Society, 2007; Dufey, 2006

Land use change is the most common impact of biomass production¹¹⁹. The choice of the feedstock and the site, where it is grown, play a significant role for the effects on biodiversity, as habitat loss is a major cause of forest biodiversity loss. If degraded or previously deforested lands are chosen and multiple species are used for biomass production, it may be beneficial for biodiversity. For example, woody biomass production in short rotation coppice willow stands may be beneficial to different bird insect and plant species¹²⁰. Similarly, biofuels derived from residues could have an overall positive effect on both climate change mitigation and biodiversity, as no significant land use change is required. At the same time, if forest land is converted to establish energy crop plantations, especially monocultures, biodiversity will most likely be degraded. In these cases also the reduction of emissions achieved through the use of biofuels might be outweighed by the release of greenhouse gases stemming from land-use change, especially if peatlands are converted.

Bioenergy can only be considered renewable if biomass growth exceeds harvest, and carbon dioxide emitted during production, transportation and processing does not exceed that captured during growth¹²¹. In that context, carbon losses associated with conversion of land for biomass production need to be taken into account.

The production of energy crops can also have impacts on water availability and quality, as well as increase soil erosion and nutrient leaching leading to further degradation of habitats and biological diversity. In addition, an increased use of fertilizers and pesticides¹²² to improve accumulation of biomass might contribute to biodiversity loss and enhance greenhouse gas emissions (see also chapter III B). Furthermore, the potential introduction and establishment of alien invasive species for energy production might be detrimental to forest biodiversity (see also chapter II B).

The growing worldwide interest in woody biomass and biofuels has raised concerns about deforestation, land-use changes and the loss of major carbon sinks. The pressure from other land uses on forests could grow tremendously over the next years. Several studies present potential risks of energy crop plantation expansion into forest area, especially in South-East Asia and the Amazon basin¹²³. It has been noted that the demand for oilseed has already begun to put pressure on land designated for conservation in some countries¹²⁴ and the demand for palm oil has contributed to extensive deforestation in parts of South-East Asia¹²⁵. As biomass can be produced most efficiently in tropical regions, there are strong economic incentives to replace often highly biodiverse natural forest ecosystems with energy crop plantations.

¹¹⁹ As the issue of biofuel production is strongly related to challenges emerging from climate change response policies, several impacts of bioenergy production on forest biodiversity are already addressed in chapter III B.

¹²⁰ The Royal Society, 2007

¹²¹ FAO, 2008

¹²² CBD, 2008b

¹²³ CBD, 2007a

¹²⁴ CDB, 2008b

¹²⁵ UNEP, 2008

The potential indirect impacts of biofuel production are also raising concerns. The need for fertile land to produce biofuels may result in land conflicts and an increase in prices for food and woody material, which can negatively affect the livelihoods of indigenous and local communities¹²⁶. As potential positive socio-economic impact the production of biofuels might contribute to income generation and create employment opportunities. However, it has been noted, that biofuel production tends to favour large scale and industrial practices¹²⁷ which may effectively exclude traditional agriculture and small scale forestry. The OECD concludes in a recent report that “the rush to energy crops threatens to cause food shortages and damage to biodiversity with limited benefits”¹²⁸.

A recent evidence based study¹²⁹ came to the conclusion that there is probably sufficient land for food and biofuels, but a slowdown in the growth of biofuels is needed. At the moment, biofuels contribute to rising food prices adversely affecting poverty alleviation. Biofuels production must target idle and marginal land and use wastes and residues to avoid an increase in greenhouse gas emissions and loss of habitats and biodiversity. The study forecasts that a genuinely sustainable biofuel industry is possible, but incentives must stimulate advance technology and lower targets and stronger controls are needed, including stronger, enforced global policies.

Several countries as well as regional integration organisations have developed policies promoting the use of biofuels. In many cases these policies do not take into account the biomass types, production methods, and related potential negative environmental and social impacts¹³⁰. In this context CBD Parties committed themselves to address both, direct and indirect, positive and negative impacts that the production and use of biomass for energy, in particular large-scale and/or industrial production and use, might have on forest biodiversity and on indigenous and local communities (decision IX/5)¹³¹. The forest sector should also take into account these developments and might need to address the issue from its perspective.

A potential measure to reduce negative impacts of biofuel production and promote the positive effects is the establishment of sustainability criteria and standards. Several initiatives at different levels are currently developing guidelines and standards. For example, at the global level, the Roundtable on Sustainable Biofuels, a group of international experts, issues a first draft of “Global principles and criteria for sustainable biofuel production”. About 300 specialists contributed their expertise to this standard. At regional level, the European Union (EU) already launched a consultation on principles, criteria and indicators for bioenergy production. A respective document has been prepared by the European Commission, and an EU Directive including sustainability criteria for biofuels has been envisaged.

¹²⁶ CBD, 2007a

¹²⁷ UNEP, 2008

¹²⁸ Doornbosch et al., 2007

¹²⁹ Renewable Fuels Agency, 2008

¹³⁰ CBD, 2008b

¹³¹ Biofuels in the context of agriculture are also dealt with in decision IX/2.

The expansion of biofuel production will need to be accompanied by clear and well enforced land-use regulations, particularly in tropical countries in order to prevent further losses of forest land and biodiversity. In this context, also the coordination and cooperation between agriculture and forestry sectors has to be strengthened. To reconcile bio-energy production objectives and forest conservation is a major issue. In this context it is noted that primary and modified natural forests tend to have the greatest biological diversity and at the same time a very high potential for carbon storage – “a win-win situation if these forests are preserved”¹³². However, the present situation represents “both a major challenge and opportunity”¹³³ for the forest sector.

IV Protected Forest Areas

Protected areas are a means in SFM for securing the conservation of biological diversity of specific sites and are a cornerstone of conservation policies as they are seen as one of the most important instruments for meeting globally agreed targets for maintaining biodiversity.

In Global Objective 3 of the NLBI countries committed themselves to work towards increasing significantly the area of protected forests. With respective national measures UNFF Member States should create, develop or expand, and maintain networks of protected forest areas, taking into account the importance of conserving representative forests by means of a range of conservation mechanisms, applied within and outside protected forest areas¹³⁴. In addition Member States should assess the conditions and management effectiveness of existing protected forest areas with a view to identifying improvements needed¹³⁵. Furthermore, UNFF Member States committed themselves to develop and establish positive incentives in order to increase the area of protected forests¹³⁶.

Several other global commitments are addressing the goal to increase the area of effectively protected forests. The CBD endorsed the objectives of successfully establishing and maintaining by 2010 terrestrially a global network of comprehensive, representative and effectively managed national and regional protected area systems as well as the target to include 10% of all forest types in protected areas by 2010. These targets are also included in the Global Strategy for Plant Conservation¹³⁷. The CBDs Expanded Programme of Work on Forest Biological Diversity (decision VI/22) defines the objective to ensure adequate and effective protected forest area networks. Furthermore, the Conference of Parties decided¹³⁸ to strengthen efforts in that regard, taking into account the target of having at least 10% of each of the world’s forest type effectively conserved. In addition, the efforts to provide for

¹³² CBD, 2007a

¹³³ FAO, 2008

¹³⁴ NLBI A/RES/62/98, V. National policies and measures, paragraph 6 (b)

¹³⁵ NLBI A/RES/62/98, V. National policies and measures, paragraph 6 (q)

¹³⁶ NLBI A/RES/62/98, VI. International cooperation and means of implementation, paragraph 7 (d)

¹³⁷ Decision VI/9

¹³⁸ Decision IX/5

sustainable financing of forest protected areas from all available resources should be strengthened.

Early protected areas were mainly set up to preserve either particular species or spectacular scenery or sometimes water resources. More recently, the aims of protected areas have become wider and a broader ecosystem function has been increasingly recognised, both within a protected area itself and also as it relates to the wider landscape. In addition to their biodiversity function, people benefit directly from the genetic potential of wild species, the environmental services provided by natural ecosystems, recreational opportunities in national parks and the refuge given to traditional and vulnerable societies¹³⁹.

There is a wide range of definitions and categories for protected areas at national, regional and global levels. The CBD as the global convention on biodiversity conservation defines protected area as “a geographically defined area that is designated or regulated and managed to achieve specific conservation objectives”.¹⁴⁰ The IUCN as main global standard setting organization regarding protected areas for biodiversity conservation defines a protected area as “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means”¹⁴¹.

A range of land-use approaches is required to deal with forest protection, management and restoration. These approaches include a variety of protected area types. Protected forest areas for biodiversity conservation are only one instrument among several for the responsible management of forest resources. They need to be supplemented and complemented with other types of forest management, including other kinds of protection, for example safeguarding environmental services such as watershed protection, or creating temporary protection through time-limited conservation payments¹⁴². A very wide variety of terms and approaches are used to define forests with different conservation functions; research in Europe and the Russian Federation found over 500 different terms used to define protective functions and classifications in forests¹⁴³. Many of these would not fall within the IUCN definition of “protected area”, but nonetheless have a very important role to play in the protection of the forest landscape.

¹³⁹ Dudley et al., 2006

¹⁴⁰ CBD, 1992

¹⁴¹ Dudley et al., 2006

¹⁴² Dudley et al., 2006

¹⁴³ MCPFE, 2003

A Status and Trends of Protected Forest Areas

Globally, protection areas have significantly increased over the past century, resulting in nearly 16 million km² of earth nationally designated as protected areas in 2006¹⁴⁴.

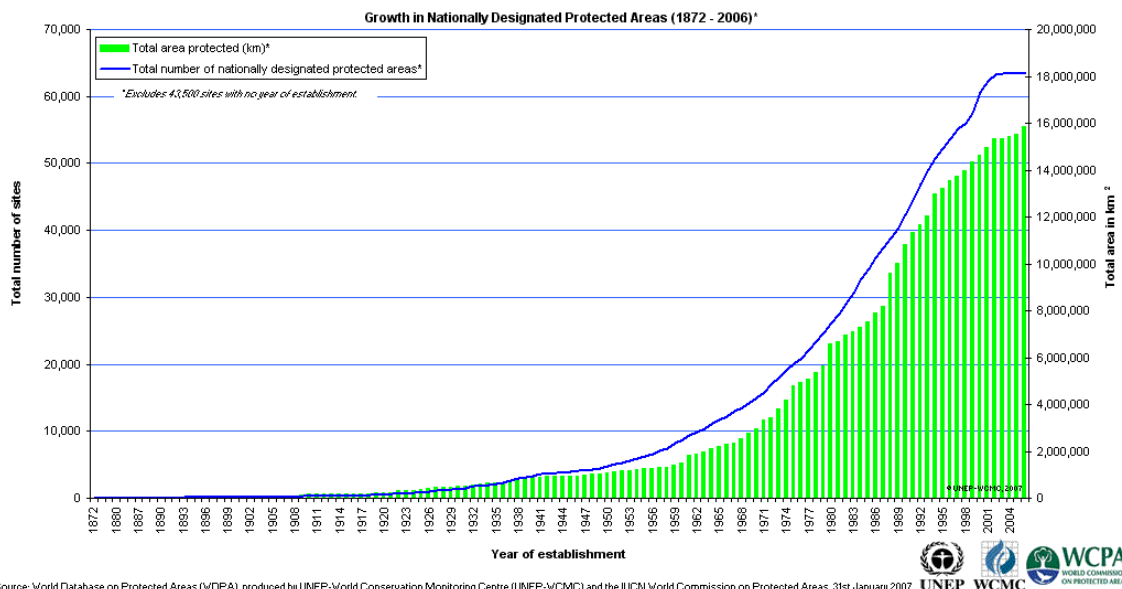


Figure 3: Growth in Nationally Designated Protected Areas. Source: UNEP-WCMC, 2007c

FAO FRA 2005 collected data on forests and other wooded land designated for the conservation of biological diversity. The figures include, but are not limited to, protected areas. The report shows that the area of forests conserved primarily for biodiversity protection has increased over the past decade reaching 11.2% or close to 421 million hectares in 2005. This equates to an increase of 32% (96 million ha) since 1990. While the total area of forest designated for conservation of biodiversity, including areas where biodiversity protection was not the primary function, was reported to be 1 billion ha. However, there is an information deficit concerning this figure with little more than 40% of countries reporting for the FAO FRA providing information on the subject¹⁴⁵.

¹⁴⁴ UNEP-WCMC, 2007c

¹⁴⁵ FAO, 2006a

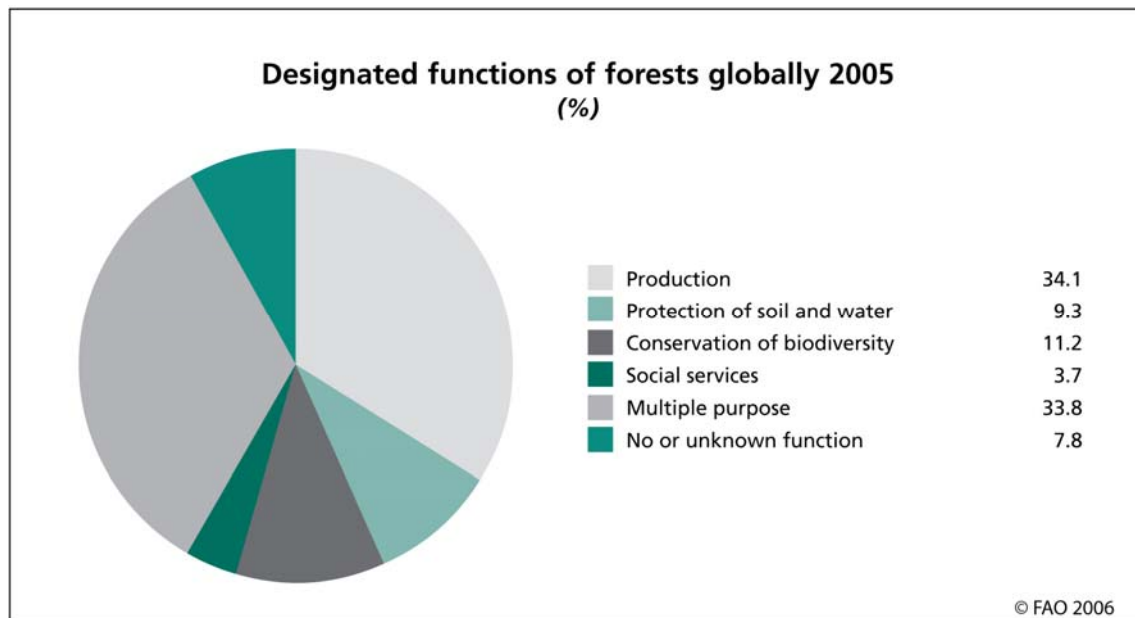


Figure 4: Designated functions of forests globally. Source: FAO, 2006

All protected areas require some form of management, with the emphasis of management varying on the desired outcomes. In recognition of the diverse objectives of protected areas, the IUCN has formulated six categories of management¹⁴⁶:

- Ia: area managed mainly for science or wilderness protection
- Ib: area managed mainly for wilderness protection
- II: area managed mainly for ecosystem protection and recreation
- III: area managed mainly for conservation of specific natural features
- IV: area managed mainly for conservation through management intervention
- V: area managed mainly for landscape/seascape conservation or recreation
- VI: area managed mainly for the sustainable use of natural resources

As per IUCN classifications, presently 13.5% of the world's forests or more than 530 million ha are enjoying protected area status. However, only 7.7% of the protected forest areas are classified as IUCN categories I – IV, which have stricter conservation regimes. IUCN categories V and VI also cover areas for sustainable use of natural resources¹⁴⁷.

Some forest types are underrepresented or disproportionately represented in forest protected areas. This includes wetlands, tropical deciduous/semi-deciduous broadleaf forest, temperate deciduous broadleaf forest, and tropical lowland evergreen broadleaf rain forest¹⁴⁸. Studies also show that protected areas often lack connectivity¹⁴⁹. Looking at the 28

¹⁴⁶ Dudley et al., 2006

¹⁴⁷ Schmitt et al. 2008

¹⁴⁸ CBD, 2007a; CBD, 2006; Schmitt et al. 2008

forest types defined by the UNEP-WCMC Global Forest Map (GFM), 19 have less than 10% of their area under formal forest protected areas. Furthermore, 20 of 34 biodiversity hotspots as defined by Conservation International have less than 10% of their area protected¹⁵⁰.

Using the IUCN management categories I-IV as previously stated and largely defined ecoregions, Australasia and the Neotropics (South America and Caribbean) have the highest level of forest protection with 13.4% and 10.6% respectively, while the Afrotropics (Sub-Saharan Africa), Palearctic (Bulk of Eurasia and North Africa) and Nearctic (most of North America) forests have the least protected forests with 6.4%, 5.5% and 6.6% respectively. In this context a global study on global ecological forest classification and forest protected area analysis suggests closing gaps in protected forest areas by focusing on certain forest types and ecoregions¹⁵¹ and adapting policy targets for different areas according to the global significance of their biological diversity.

Specific regional initiatives

In the framework of the ITTO transboundary conservation project portfolio eight transboundary protected forest areas have been established presently covering over ten million hectares in the three tropical forest regions of Africa, Asia-Pacific and Latin America and the Caribbean. Two or more ITTO member countries cooperate in the management and conservation of these ecologically important areas straddling the borders of the countries concerned. While conserving wildlife and diversity, these transboundary protected areas also help improve the livelihoods of forest communities; promote peace and cooperation between neighbouring countries; and control illegal logging and wildlife smuggling.¹⁵²

In the MCPFE Assessment Guidelines for Protected and Protective Forests and other Wooded Land in Europe have been developed to address the specific pan-European situation. The Guidelines aim at providing a comprehensive picture of protected and protective forests in Europe as basis for further work on the conservation of forests and they are linked to international classification systems for protected areas, including the IUCN categories. Recent data collected on basis of the Guidelines show that the area of protected forests has been expanding by about 2 million ha in the last five years to reach almost 5% of Europe's forests. About 3% of Europe's forests are protected with the main objective of conservation of biodiversity and another 1.7% with the main objective of conserving landscapes and specific natural elements. For the MCPFE region excluding the Russian Federation, the figures are 8% and 10%, respectively.

¹⁴⁹ CBD, 2007a

¹⁵⁰ Schmitt et al. 2008

¹⁵¹ Schmitt et al. 2008

¹⁵² ITTO statement at the webforum "Forests and Biodiversity Conservation, including Protected Areas" hosted by the UNFF secretariat at esaconf.un.org/WB/default.asp?action=10&boardid=46&fid=667 in June 2008

B Threats and Opportunities for Protected Forest Areas

The conservation goal of protected areas can be endangered by different factors. Direct threats are (human) activities or processes that are causing the destruction, degradation and/or impairment of biodiversity and natural processes. Underlying causes of threats are social, economic, political, institutional, or cultural factors that enable or otherwise contribute to the occurrence and/or persistence of direct threats¹⁵³.

Generally, the conservation goal of protected areas might be diminished through the removal of individual elements of the protected area without alteration to the overall vegetation structure (e.g. animal species used as bushmeat, valuable timber trees, exotic plants), an overall impoverishment of the ecology of the protected area through e.g. encroachment, long-term air pollution damage or persistent poaching pressure as well as major conversion and degradation through e.g. removal of forest cover, driving roads through the protected area, major settlements or mining.

According to recent studies evaluating protected areas the most common direct threats tend to be hunting, killing and collecting animals; logging and wood harvesting; gathering non-timber forest products; recreational activities; and the management of adjacent lands. These issues show some consistency across regions, though differences are seen in countries like Australia, where invasive species and fire management are more serious threats¹⁵⁴. Many assessments are based on the views of managers of protected areas and vary from outcomes of studies based on global developments and perspectives, which list especially invasive alien species as major threats. The reasons for the differing conclusion might need further research.

Wildlife is hunted for food, trophies (most often skins, teeth, antlers and horns), medicines and other traditional uses (most hard and soft body parts), and as pets (especially primates, birds and reptiles). Individuals hunt tropical forest wildlife primarily to eat and/or sell it. Hunting and poaching was also reported as the most common threat to protected areas in Latin America and parts of Africa in regional studies¹⁵⁵. The hunting of tropical forest wildlife for food (known as “bushmeat”, “wild-meat”, and/or “game meat”) is a major issue especially for protected forest areas. Bushmeat includes any non-domesticated terrestrial mammals, birds, reptiles and amphibians harvested for food. It is especially the larger vertebrates which constitute the majority of the terrestrial wild animal biomass consumed by humans. Hunting for food in tropical forests is an issue of concern for primarily three reasons:

- There is strong evidence illustrating that the scale of hunting, occurring in these regions, poses a real threat to many tropical forest species.

¹⁵³ IUCN-CMP, 2006

¹⁵⁴ Leverington et al. 2008

¹⁵⁵ Dudley et al., 1999

- The depletion of wildlife is intimately linked to the food security and livelihood of numerous tropical forest-region inhabitants as many of these forest-dwelling or forest-dependent people have few alternative sources of protein and income.
- Many of the ways in which hunting and wildlife trade operate, as well as their links to livelihood or ecosystem function, are either poorly understood or not properly taken into account¹⁵⁶.

In addition to hunting, the collecting of specific species for sale, especially through commercial (plant) collectors, who remove valuable plants for resale, has impacts on many protected areas. For example collection of wild cyclamen species is threatening biodiversity in many protected areas in Turkey.

Bushmeat issues¹⁵⁷

Bushmeat issues in tropical forests are a good example for the interlinkage between threats, challenges and opportunities related to forest biodiversity conservation in protected areas. The so-called bushmeat crisis is foremost a problem resulting from an unmanaged common resource being unsustainably harvested because of inadequate governance and policy frameworks. It could be considered as a facet of the “tragedy of the commons”.

States tend to monopolize control over high value timber and mineral resources of forests, without necessarily having the capacity to manage those resources efficiently for a common public benefit. The issue of bushmeat would need to be dealt with in the broader framework of renewable resource management (like timber or fuelwood) and, ideally, sound governance regimes for the management of all resources, should be in place.

The harvesting of wildlife, especially for food, is a complex issue, in which biological issues and conservation concerns play an important role alongside livelihood issues, including traditional practices. In order to solve the problem, actions will have to be taken at all levels from the international policy dialogue to the field-project level. If attention is focused solely on field-level initiatives, such as protected-area management, then the underlying forces driving unsustainable and unregulated harvest will continue. Both governance and management issues need to be addressed concurrently, albeit at different levels.

Hunting or harvesting wildlife is a territorial activity with the three interacting dimensions: space – rules - institutions that need to be considered concomitantly. At the policy or governance level, many of the underlying causes of the unsustainable use of wildlife and the loss of biodiversity are the same as those underlying poverty. For example weak local governance, war, famine and unfavorable terms of trade impact both poverty and the use of wildlife. There seems to be room for conservation and development agencies to improve cooperation¹⁵⁸.

¹⁵⁶ Nasi et al., 2008

¹⁵⁷ based on Nasi et al., 2008

¹⁵⁸ Davies 2002

Sound governance regimes for the management of all resources are an important element in the development of the sustainable use of renewable natural resources. Recent political developments suggest that decentralization and devolution of government could contribute to the more effective and efficient management of local natural resources. However, several examples suggest that decentralization ends up in privileging a short-term resource exploitation approach rather than a long-term sustainability approach because of high local discount rates or short-term political concerns and interests. For decentralization to work it has to go hand in hand with empowerment of the resource's users and education on what is sustainable.

Box 5: Bushmeat issues

Most of the world's protected areas contain human communities and many of these are currently expanding in numbers and in their use of the land. Whilst this is not necessarily a negative state of affairs as such, illegal activities connected to the encroachment by human settlements might increase, especially related to agriculture and overgrazing. For example, research on threats to high biodiversity forests identified agriculture and grazing as the number one impact and densities of livestock inside national parks is higher than outside. There is also evidence that in many countries protected forests are particularly targeted by illegal logging activities and that many protected areas have clauses allowing mining operations and fossil fuel extraction to continue¹⁵⁹.

Tourism and recreation in protected forest areas, providing an opportunity for a sustainable use of biodiversity and for sustained local livelihoods, may turn into pressures and threats causing major disturbances, if not managed adequately.

The biodiversity of many protected forest areas is being or will most likely be impacted by the general global threats, i.e. climate change, invasive alien species and pollution. Respective effects on forest biodiversity are outlined in chapter II and III. Furthermore, wars are often having major impacts on protected areas and might lead to heavy deterioration of the forest ecosystems and their biological diversity, especially populations of mammals.

Many of these threats relate to the interface between conservation and human welfare, and are extremely challenging to resolve. Deforestation or intensified land use up to the protected area boundary is in many cases leading to increased pressure and 'edge effects'. This is an issue in some more developed countries, such as Australia, as well as in tropical countries with rapidly increasing populations and changing economies.

The frequency of threats from hunting, adjacent land use, farming and grazing, and settlements recorded in assessment studies within protected areas across most of the world confirms the concern that protected areas which seem to be maintaining their values may in fact be experiencing more subtle declines and loss of species diversity¹⁶⁰.

In addition to the conservation of biological diversity and ecological and evolutionary processes protected areas provide potential benefits regarding:

¹⁵⁹ Dudley et al, 1999

¹⁶⁰ Leverington et al. 2008

- Poverty reduction and supporting livelihoods of people through maintaining ecosystem services, including food security by ensuring the survival of important wildlife/fish populations;
- Economic developments and income generation as a key asset for tourism industry;
- Health: Supply with medical plants and specific biochemical components for pharmaceutical production and barriers for diseases and epidemics;
- Maintenance of plant genetic resources for food and agriculture;
- Fresh water supply for rural and urban populations;
- Mitigation of the effects of natural disasters through acting as barriers and buffer zones;
- Capacity to adapt to climate change as well as contributing to climate change mitigation as carbon sinks;
- Recreation;
- Protection of cultural and spiritual values;
- Protection of territories and rights of indigenous and local communities inter alia through maintaining resources and space to continue traditional lifestyles¹⁶¹.

The benefits of protected areas can extend spatially far beyond their boundaries. In order to support these benefits considerations of protected areas development and management should be incorporated into general sustainable development and economic strategies¹⁶².

Protected areas could also play a role in reducing national-scale deforestation in the context of the REDD measure discussed under the UNFCCC through both, strengthening forest protection in existing protected as well as designating new protected forests. The evidence suggests that protected areas are an effective tool for reducing deforestation within their boundaries.

In the context of threats and opportunities regarding protected forest areas aspects of indigenous and local community participation need to be addressed. In order to further the global goals regarding sustainable development and poverty alleviation, protected forest areas should not violate, but possibly enhance the rights of poor, vulnerable communities. A large number of rural poor rely on forest resources and costs and benefits of protected (forest) areas have been analysed and documented in many cases. Costs may range from the displacement of communities to impacts on their crops and often include restricted access to forest resources and changes in land tenure. Benefits are often the maintenance of environmental services, eg. watershed protection and can include direct revenue from environmental protection. The management of protected areas can also strongly influence traditional social values and behaviours. The balance of costs and benefits as well as the

¹⁶¹ Mulongoy et al, 2008

¹⁶² Mulongoy et al, 2008

impact of protected areas is largely dependent on the specific area status and governance¹⁶³. Conflicting interests between these communities and protected areas might threaten conservation goals, if not balanced in an integrative and participatory approach in establishing and managing the protected areas. Both, the rejection of conservation measures as well as the loss of traditional knowledge and traditional ways of life might contribute to negatively impacting on forest biodiversity conservation. In this context, especially possible effects on livelihoods and poverty alleviation need to be taken into account. The CBD is addressing these issues in decisions (VI/10, VII/16) related to its Article 8j on traditional knowledge and emphasizes to take into account the rights of indigenous and local communities when establishing protected areas.

A major limiting factor for establishing and adequately managing protected areas is financing the respective costs. Despite some national and regional success stories the establishment and maintenance of protected forest areas globally shows considerable funding gaps in developing countries. Three separate studies estimated the total annual cost for effective management of the existing protected areas in developing countries to range from US\$ 1.1 billion to US\$ 2.5 billion per year and the funding shortfall (total cost minus current funding) to vary between US\$ 1.0 and 1.7 billion per year. Since the Convention on Biological Diversity came into force in 1993, the world's protected areas grew almost by 100% in number and 60% in size, yet for the same period, international financing for biodiversity conservation grew only 38%. New funding opportunities for carbon sequestration could play an important role in closing this gap¹⁶⁴.

Regarding options for mobilizing financial resources for protected areas the CBD encourages Parties in decision VIII/24 to elaborate financial plans, incorporating a diversity of national, regional, and international sources to meet the costs to effectively and sustainably implement and manage national and regional protected area systems. In addition, in this decision the Conference of Parties invites the Global Environment Facility to support national and regional systems of protected areas.

C Condition and Management Effectiveness of Protected Forest Areas

Even though the last decade has witnessed an unprecedented increase in the area of forest under formal protection, forest degradation and the loss of forest biodiversity is ongoing, as already outlined in preceding chapters. To use the full potential of protected areas for conservation there is a need to assess the management efficiency of protected forest areas and ensure that they are well-managed according their conservation goals. The benefit of protected forest areas is only maintained if there is effective management in conserving the forest values.

¹⁶³ UNEP-WCMC, 2008

¹⁶⁴ Bruner et al., 2004; James et al., 1999; Vreugdenhil, 2003

Management effectiveness evaluations assess how well protected areas are managed, especially the extent to which the conservation and objectives are achieved. Respective assessment processes usually address design issues related to both individual sites and protected area systems, the adequacy and appropriateness of management systems and processes and the delivery of protected area objectives including conservation of values.

A wide range of approaches and methodologies for assessing the management effectiveness of protected areas has been developed by international organizations as well as national agencies responsible for protected areas and conservation related NGOs. Depending on the purpose, assessments of protected areas are conducted at different scales and levels, from detailed site-level studies to broad system level assessments. A respective review lists more than 40 methodologies, being applied from national to global levels¹⁶⁵.

The globally most widely used methodologies are RAPPAM and the Tracking Tool. The Rapid Assessment and Prioritization of Protected Areas Management (RAPPAM), developed for WWF, aims at providing agencies responsible for protected areas with a country-wide overview of the effectiveness of protected area management, threats, vulnerabilities and degradation. The aims of RAPPAM are to identify management strength and weaknesses, analyze pressures and threats across entire protected area systems, identify areas of high ecological and social importance, prioritize policy interventions, identify appropriate follow-up steps.

The Tracking Tool, developed by the World Bank and WWF, is designed to further track and monitor progress towards worldwide protected area management effectiveness. It is aimed at being a simple and cheap tool to be used by park staff, while supplying consistent data about protected areas and management progress over time. The aims of the Tracking Tool are to identify progress in management effectiveness of protected area projects, to provide baseline data, to identify trends and priorities for developing tools and policies, identify key management issues of specific protected areas and related follow-up steps.

Management effectiveness evaluation methodologies used in global studies		
Abbreviations	Methodology name	Organisation/Affiliation and/or reference
RAPPAM	Rapid Assessment and Prioritisation of Protected Area Management	WWF (Ervin, 2003b)
Tracking Tool	Management Effectiveness Tracking Tool	World Bank/WWF Alliance (Stolton <i>et al.</i> , 2007)
EOH	Enhancing our Heritage	UNESCO (Hockings <i>et al.</i> , 2007)
How is Your MPA Doing?	How is Your MPA Doing?	NOAA/National Ocean Service/IUCNWCMA Marine, WWF (Pomeroy <i>et al.</i> , 2004)
TNC CAP	Conservation Action Planning	TNC (The Nature Conservancy, 2007)

¹⁶⁵ Leverington *et al.* 2008a

Marine Tracking Tool	WWF-World Bank MPA score card	WWF-World Bank (Staub and Hatzioios, 2004)
CI METT	Conservation International Management Effectiveness Tracking Tool	Conservation International

Box 7: Management effectiveness evaluation methodologies for protected areas used in global studies
Source: Leverington et al., 2008

About 6% of the protected areas included in the World Database on Protected Areas have been evaluated in published assessments. Recent studies, based on examinations of management effectiveness in about 6,300 protected areas in 100 countries, indicate that 65% of the areas have ‘basic management with significant deficiencies’, scoring between 0.33 and 0.67 on a scale of 0 to 1. Only 21% scored in the ‘sound management’ range; the average score was 0.53¹⁶⁶. Scores increased over time for those protected areas where repeat assessments were conducted.

Management effectiveness was assessed through the examination of the planning, inputs, processes, outputs and outcomes associated with the forest management through respective headline indicators. The assessment showed clear pattern in the strength and weaknesses of the management. Overall, indicators on park gazettement, marking of boundaries, resolution of tenure issues, effectiveness of governance and leadership and the skill level of staff and other management partners obtained the highest scores. Conversely, indicators for programmes of community benefit, funding reliability and adequacy, management effectiveness evaluation, maintenance, communication, and community involvement got the lowest scores¹⁶⁷. Very low scores for security of funding and especially for adequate equipment and infrastructure, which is highly correlated with effective management, are of concern and might deserve some serious attention. Many protected areas showed of lack basic requirements to operate effectively, and did not have an effective management presence. However, even where ‘inputs’ and many ‘processes’ are weak, protected areas were still performing a valuable function for conservation and in the community.

In general, protected area assessments show that management effectiveness is directly correlated with financial and human resources¹⁶⁸. Protected forest areas located in countries with a high Human Development Index (HDI) are scoring on average one third higher in assessments than those located in low HDI countries¹⁶⁹. Nevertheless, the management effectiveness of a number of protected areas in developed countries shows considerable deficiencies.

Respective studies conclude that it is essential that national governments provide better policy support for tenure resolution in some cases, and for appropriate development planning and control around protected areas. The consistent nomination of adjacent land use or ‘buffer zone management’ as a major threat emphasizes the need to consider protected

¹⁶⁶ Leverington et al. 2008

¹⁶⁷ Leverington et al. 2008

¹⁶⁸ ITTO, 2006a

¹⁶⁹ Leverington et al. 2008

areas in the wider landscape, especially as they are faced with additional pressures from climate change¹⁷⁰.

V Cross-sectoral Cooperation in the Conservation of Forest Biodiversity

Biological diversity in forests is not only affected by actions under forest management regimes; policies and management actions in other sectors often have unintended, or even intended, consequences for forests and forest biodiversity. For sustainable management and maintenance of forest cover to be a holistic consideration, governance in sectors other than forestry needs to understand the consequences on forests that result directly and indirectly from their policies. Consequently, these sectors need to address respective issues in policy formulation in order to reduce impacts on forest biodiversity.

Furthermore, policy is developed at, and affects, different scales, including international policies (e.g. UNFF, CBD, UNFCCC), regional processes (e.g. ASEAN, MCPFE, COMIFAC), national policies and local policies that influence individual communities directly. What is often missing is consistency among these various levels of policy, usually because of a lack of direct connection among government departments, or between levels of government¹⁷¹. In this context, the collaboration of national level focal points of international policy instruments seems to be a prerequisite for a coordinated policy development and implementation.

A International Cross-sectoral Cooperation

The need for better coordination and collaboration has been widely recognized by the governing bodies of international forest-related conventions, organisations and processes. Among the nine principal functions of the UNFF is to enhance cooperation as well as policy and programme coordination on forest-related issues among relevant international and regional organisations, institutions and instruments, and contribute to synergies among them. Collaboration is also mentioned in convention texts of the CBD, UNFCCC and UNCCD. In addition, several declarations, conclusions and decisions call for coordination, closer collaboration and fostering synergies among respective processes, including the CPF.

Besides strengthening the political commitment to sustainable forest management and enhancing the contribution of forests to achieving the internationally-agreed development goals, the purpose of the NLBI is to provide “a framework for international cooperation”.¹⁷² Accordingly, paragraph 6 (k) of the NLBI, urges countries to identify and implement measures to enhance cooperation and cross-sectoral policy and programme coordination

¹⁷⁰ Leverington et al. 2008

¹⁷¹ Thompson et al., 2008

¹⁷² NLBI A/RES/62/98, I. Purpose, paragraph 1(c)

among sectors affecting and affected by forest policies and management, with a view to integrate the forest sector into national decision-making processes and promote sustainable forest management, including by promoting forest conservation.

At the global level there have been already co-operative **mechanisms** established to facilitate collaboration on forest biodiversity conservation:

- The *Biodiversity Liaison Group* of the heads of the secretariats of five biodiversity related agreements (CBD, CITES, Ramsar Convention, Bonn Convention, World Heritage Convention, International Treaty on Plant Genetic Resources for Food and Agriculture) was established in 2004 to enhance coherence and cooperation. Cooperative activities focus on compilation of case-studies, joint work plans of the convention bodies and development of indicators for assessing achievement of the 2010 biodiversity target.
- The *Joint Liaison Group of the Rio Conventions* (secretariats and the office holders of the scientific subsidiary bodies of the CBD, UNCCD and UNFCCC) was established in 2001. Its purpose is to improve the exchange of information, to explore opportunities for synergistic activities and to increase coordination among the three conventions. To date, collaborative activities have included the development of joint programmes of work of the secretariats, preparation of technical reports and involvement in outreach activities.
- The *Collaborative Partnership on Forests (CPF)* was established in 2001 to support the work of the UNFF and to enhance cooperation and coordination on forest issues in order to promote the management, conservation and sustainable development of all types of forests. The CPF is an informal, voluntary arrangement for cooperation among 14 forest-related international organizations, institutions and convention secretariats. It is chaired by the FAO. The CPF engages in many joint activities, often through groups formed by experts from among its members, and produces joint statements and papers on relevant issues.

The respective UNFF bodies are only part of the CPF, but not of the Biodiversity Liaison Group or the Joint Liaison Group of the Rio Conventions.

Several **global activities** of intergovernmental fora have been undertaken aiming at enhancing coordination and collaboration in forest biodiversity conservation:

An assessment of the relationship between the IPF/IFF proposals and the activities of the expanded programme of work on forest biological diversity was undertaken by UNFF and CBD secretariats in collaboration with the members of the CPF and other relevant bodies institutions and processes as requested by CBD parties in decision XI/26. Consequently, the document prepared in 2003¹⁷³ highlighted that, overall, 90 out of 130 activities within the expanded programme of work show some correspondence to a given IPF/IFF proposal for action, while the extent of such correspondence varied widely. The topic was discussed at the fourth session of the UNFF in 2004 but no consensus was reached on the issue.

¹⁷³ CBD, 2003

The CPF's activities related to the conservation of forest biodiversity include a task force on streamlining reporting, harmonizing forest terms and definitions and the development of a sourcebook on financing for SFM. CPF members also engage in collaborative activities related to improving governance and law enforcement; monitoring, assessment and reporting; forest landscape restoration and restoration of degraded lands.

The Joint Liaison Group of the Rio conventions (CBD, UNCCD, UNFCCC) held a workshop to assess the inter-linkages between the conventions, and to identify and promote synergies concerning forests and forest ecosystems in Viterbo, Italy, in 2004. The Viterbo workshop discussed ways and means for planning and implementing plans and programmes that coherently address the provisions of all three conventions regarding forests and forest ecosystems. The workshop encouraged, *inter alia*, development of joint pilot projects, efficient communication between the national focal points of the three Rio conventions and other relevant stakeholders (particularly UNFF and GEF), and sharing of information. National forest programmes were recognised as a fundamental mechanism for synergy in many countries.

Joint work plans and programmes have been prepared for example between the Ramsar Convention and the CBD, and between the UNCCD and the CBD. The relevance of the joint Ramsar-CBD work plan to the implementation of the CBD work programme on forest biological diversity is currently being analysed.

In its decisions on forest conservation and protection of unique types of forests and fragile ecosystems at UNFF2 the Forum urges countries to strengthen international cooperation on finance, trade, transfer of environmentally sound technology and capacity-building for the conservation and protection of unique types of forests and fragile ecosystems, taking into account the importance of that issue for SFM. Furthermore, in their Ministerial Declaration and Message from the UNFF to the WSSD, the Ministers responsible for forests stress the need for cross-sectoral cooperation and encourage the effective cooperation between the CBD and UNFF secretariats.

Promoting synergies and enhancing cooperation has been addressed in various decisions related to forest biodiversity under the CBD. Recently, the ninth Conference of the Parties in 2008 committed itself in decision IX/5, paragraph 1 (i) on forest biodiversity to increase cross-sectoral coordination and initiatives at all levels to facilitate coordinated implementation of both the programme of work under the CBD, and decision set by the UNFF, including the NLBI, for the achievement of the 2010 target and the four Global Objectives on Forests. The Review of the Implementation of the CBD Programme of Work on Forests shows that lack of coordination is among the main constraints for successful implementation. In this context, in decision X/5 the Conference of Parties also requests the Executive Secretary to explore possibilities to develop a work plan with joint activities between the secretariats of the CBD and UNFF. Furthermore, the decision on biodiversity and climate change (IX/16) emphasises the promotion of synergies and cooperation regarding forest biodiversity and calls for

involvement of focal points from UNFF and relevant forest related conventions in issues of forests and climate change.

Further selected CBD commitments related to cooperation on forest biodiversity

As overarching goal, the Parties to the CBD committed themselves to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth. This target was subsequently endorsed by the World Summit on Sustainable Development and the United Nations General Assembly and was incorporated as a new target under the Millennium Development Goals. Consequently, the **2010 Biodiversity Target** has been agreed in a variety of fora and formulations. The CBD also developed a framework to enhance the evaluation of achievements and progress toward its implementation and that of its 2010 Biodiversity Target (decision VII/30).

COP6 adopted the expanded programme of work on forest biological diversity (POW) in decision VI/22 and agreed to establish an Ad Hoc Technical Expert Group (AHTEG) to provide advice in the review of the implementation of POW. At the national level, the COP urged Parties to incorporate relevant objectives of the POW into their national biodiversity strategies and action plans and their national forest programmes. The COP also requested the Secretariat to continue its support of and collaboration with the work of the UNFF and of the CPF. Furthermore, it stressed collaboration with the United Nations Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change.

COP7 invited Parties in decision VII/1 to further develop, cooperation at the regional level in their efforts at implementing the activities contained in the work programme; to enhance cross-sectoral integration and inter-sectoral collaboration on the implementation of the work programme at national and sub-national levels; and to enhance their efforts in implementing the programme of work on forest biological diversity as an essential contribution towards advancing the 2010 global biodiversity target.

COP8 requested the Executive Secretary in decision VIII/19 inter alia to produce a toolkit on cross-sectoral, integrated approaches, to synergize the existing information on the implementation of national forest programmes and national biodiversity strategies and action plans.

Most recently, at **COP9** Parties reviewed the POW, and, in decision IX/5, decided to continue to strengthen its implementation, and addressed as a matter of priority major human-induced threats to forest biodiversity, including unregulated and unsustainable use of forest products and resources (including unsustainable hunting and trade of bushmeat, and their impacts on non-target species), climate change, desertification and desert creep, illegal land conversion, habitat fragmentation, environmental degradation, forest fires and invasive alien species.

Parties also adopted a decision on the use of genetically modified trees, reaffirming the need to take a precautionary approach (see also chapter III B). The COP also requested the Executive Secretary to facilitate regional, sub-regional and/or thematic workshops, in close cooperation with existing international, regional and sub-regional processes, initiatives and organizations to support implementation of the POW.

Box 7: selected CBD commitments related to cooperation on forest biodiversity

At the regional level, intergovernmental processes and organisations are collaborating on forest biodiversity issues in various initiatives in addition to global activities. The International

Year of Biodiversity 2010 and the International Year of Forests 2011 are further efforts to provide opportunities for enhanced cooperation at all levels. Despite the progress made so far, there continues to be a need to improve international cross-sectoral cooperation with the objective of promoting biodiversity conservation in SFM. The NLBI offers an opportunity for the UNFF to build linkages with other processes on basis of its main objective and its principal functions¹⁷⁴, and to promote on the ground implementation of SFM through a holistic approach that brings together all stakeholders.

For example, a joint UNFF work plan with the CBD could address strengthening governance and law enforcement in the context of SFM and protected forest areas; securing sustainable financing for forest biodiversity conservation; common approaches how to address forest biodiversity conservation in climate change response activities and how to integrate forest biodiversity considerations in standards for bio-energy production, as well as the enhancement of cooperation with other sectors relevant for forest biodiversity conservation, especially through enhancing coherence and synergies of procedural policy instruments.

B National Forest Programmes and National Biodiversity Strategies and Action Plans

Different forest related policy processes have identified their respective national strategies, programmes and plans as effective means for the implementation of their commitments. These policy instruments are based on holistic, inter-sectoral and participatory approaches. Coherence, coordination and integrative processes between the strategies, plans and programmes are regarded as essential for a successful policy implementation. When addressing forest biodiversity, **national forest programmes** and **National Biodiversity Strategies and Action Plans** are most relevant.

In the IPF/IFF process several proposals for actions regarding the formulation and implementation of **national forest programmes (nfps)** were adopted and countries agreed on basic principles for nfps. The Ministers responsible for forests stressed the importance of nfps at UNFF2 and the UNFF repeatedly confirmed the role of nfps as comprehensive forest policy framework as basis for sustainable forest management. In the NLBI Member States agreed to develop, implement, publish and, as necessary update nfps or other strategies of SFM which identify actions needed and contain measures, policies or specific goals¹⁷⁵. Furthermore, the NLBI calls for integration of nfps into national strategies for sustainable development, relevant national action plans and poverty reduction strategies¹⁷⁶. So far nfps have been initiated in more than 130 countries¹⁷⁷; FAO already collected information on experiences from 91 countries¹⁷⁸.

¹⁷⁴ As laid down in ECOSOC Resolutions 2000/35 and 2006/49

¹⁷⁵ A/RES/62/98 NLBI, V. National policies and measures, paragraph 6 (a)

¹⁷⁶ A/RES/62/98 NLBI, V. National policies and measures, paragraph 6 (k)

¹⁷⁷ FAO, 2006b

¹⁷⁸ National forest programme update 2008. FAO website www.fao.org. Accessed July 2008.

Two global initiatives were established to facilitate the development and implementation of nfps. The NFP Facility, hosted by FAO, provides country support to governments and civil society actors to manage nfp processes. PROFOR (The Program on Forests), hosted by the World Bank, focuses on analytical work and generates knowledge in the form of lessons learnt as well as new tools and approaches on key issues.

At the **regional level**, the concept of nfps has been further elaborated in Europe in the framework of the MCPFE:

Definition and principles of nfps in the pan-European Region¹⁷⁹

In the context of the MCPFE the European countries agreed on a common understanding on the national forest programmes in Europe. According the “MCPFE Approach to National Forest Programmes in Europe”, adopted at the 4th Ministerial Conference in Vienna, 2003, “a national forest programme constitutes a participatory, holistic, inter-sectoral and iterative process of policy planning, implementation, monitoring and evaluation at the national and/or sub-national level in order to proceed towards the further improvement of sustainable forest management as defined in Helsinki Resolution H1, and to contribute to sustainable development. It

- is based on national sovereignty and country leadership and on long-term high level political commitment,
- makes best use of existing capacities and is supportive to the development of intellectual, human and institutional capacity in the field of sustainable forest management, and is characterised by the following principles”:
 - Participation
 - Holistic and inter-sectoral approach
 - Iterative process with long-term commitment
 - Capacity building
 - Consistency with national legislation and policies
 - Integration with national sustainable development strategies
 - Consistency with international commitments recognising synergies between international forest related initiatives and conventions
 - Institutional and policy reform
 - Ecosystem approach
 - Partnership for implementation
 - Raising awareness

Box 8: Definition and principles of nfps in the pan-European Region

The CBD states in article 6 that each Party shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity and also

¹⁷⁹ MCPFE, 2003

integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. It therefore creates an obligation for national biodiversity planning and a requirement for mainstreaming respective issues across all sectors of the national economy and policy-making framework.

The CBD further defined **National Biodiversity Strategies and Action Plans (NBSAPs)** in respective decisions and provides guidelines for preparing, revising and implementing them. In this context, it also stresses cross-border coordination of national strategies and the importance of regional and international cooperation for implementation.

COP-9 Decision IX/8 on the "Review of implementation of goals 2 and 3 of the Strategic Plan", paragraph 8, provides consolidated guidance to assist Parties in the development and revision of their NBSAP emphasizing the need for policy integration and multidisciplinary, cross-sectoral and horizontal co-operation to ensure coherence. In addition, it strongly promotes the involvement of all relevant stakeholders and asks for participation of all relevant major groups, including indigenous/local communities, civil society representatives, private sector and scientific community in preparing, up-dating and implementing NBSAPs. Specifically, the decision calls for consulting those responsible for other sectors as well as strengthening institutional arrangements also with regard to coordination and addressing existing planning processes in other sectors to ensure coherence and coordinated implementation.

So far, 160 Parties to the CBD have developed NBSAPs and all remaining Parties are called upon to develop or complete their NBSAPs by 2010.

In general, the impacts of public policies on the forest sector must be viewed within the context of dominant plans, goals and actions regulating issues of public concern. Cross-sectoral linkages between the forest sector and other sectors may have a direct, indirect, intended or unintended effect on landowners, forest users, government agencies and non-governmental organizations. Often, unintended effects of cross-sectoral linkages only become apparent after implementation has taken place. Multi-level policy and legal frameworks influence political choices at the national and sub-national levels; impact decisions made by land users and land managers; and contribute to shaping rural and urban space. At the local and national levels, there is a need to identify the most important linkages and to assess the positive and negative impacts of policies. Governments can help mediate among different societal actors, stakeholder interests and land use practices. Analysis is required to ensure that whatever tools are implemented, they are indeed going to be effective in protecting forest biodiversity¹⁸⁰.

Different analyses come to the conclusion, that more commitment is required within governments to ensure cross-sectoral collaboration. In the absence of such cross-sectoral cooperation and communication between different relevant departments, policy-makers become inwardly focused on their sector and tend to not consider impacts on other sectors.

¹⁸⁰ FAO, 2003

Opportunities for improvement are developing an outward-looking attitude and building the capacity to use information and experience to modify policies through an adaptive approach¹⁸¹. Furthermore, stakeholder participation and transparency are two essential steps in addressing governance problems and enhancing synergies between sector policies.

The ITTO report on tropical forest management¹⁸² emphasises the same issues. Many tropical production forest countries now have National Biodiversity Strategies and Action Plans and these same countries have nfps. Biodiversity conservation in production forests falls at the interface of NBSAPs and nfps. However, the links between these two planning frameworks are often not adequately established. This is a symptom of the fact that environmental and forestry issues are often dealt with by separate agencies. The report concludes that more inter-agency collaboration is needed. Global initiatives collecting information on forest biodiversity like the FAO FRA could provide an opportunity to improve communication.

Likewise, an nfp assessment in selected countries¹⁸³ shows that in implementing nfps only limited reforms can be carried out without regard to other sectors and overall trends in the society. If the general approaches proposed in the nfp concept are not embraced by the political leadership, there is limited chance that the forest sector alone could implement them. Another less noted aspect of coordination is that there are opportunities to benefit from existing structures in other sectors. While forest sector has specific characteristics distinguishing it from other sectors, a number of activities such as the promotion of small businesses, capacity building, marketing etc. are common to several sectors.

In general, the analysis of experiences, trends and challenges in the conservation of forest biodiversity suggests that, in order to be successful, nfps and NBSAPs need to be coherent and interlinked also with national sustainable development strategies, national poverty eradication strategies as well as national climate change mitigation and adaptation strategies, including National Communications in the framework of the UNFCCC. In this context UNFF member States could use the potential of the NLBI to reinforce practical measures at the country-level to integrate forests more closely with other government policies.

¹⁸¹ Thompson et al., 2008

¹⁸² ITTO, 2006b

¹⁸³ GTZ, 2004

VI Conclusions

The NLBI and the MYPOW of the UNFF for the period 2007-2015, agreed by the Forum at its seventh session, create a strong foundation for future international forest policy initiatives, vigorously demanding further collaboration and active support on SFM.

In striving to achieve the Global Objectives on Forests by 2015, the implementation of the NLBI and realization of the Millennium Development Goals, the UNFF Member States have committed to advance the three fundamental pillars of SFM, at all levels, including to mitigate forest biological diversity loss. Serious challenges for biodiversity conservation, however, remain present and continue to increase with emerging global developments. A major cause for concern is the continued rate of deforestation and forest land conversion, especially in tropical forests, brought about by several factors within and outside the forest sector.

The dynamic and evolving concept of SFM provides a holistic and integrative approach to forest policy and management which includes the conservation of forest biodiversity. Nonetheless, further efforts are needed to implement SFM, especially in tropical forests as only 4.2 % are formally under sustainable management. In addition, global challenges such as climate change mitigation and adaptation, the growing demand for food due to population growth, poverty eradication, as well as growing use of biomass for energy production require the inclusion of new policy goals ascribed to the concept of SFM. To meet the challenges requires balancing conflicting interests and focusing on recent societal needs, increased funding and good governance. The NLBI could provide a useful tool to this end.

The adaptation of forests to, expected and unexpected, effects of climate change constitutes a major challenge which needs to become a SFM policy goal. Accordingly, approaches to climate change response measures coherent with SFM, including biodiversity conservation, need to be developed. Key attributes of SFM such as good governance, recognition of rights of forest dependent communities, and the balanced provision of forest goods and services have to be strengthened. In this context, economic options and incentives, capacity building, promotion of livelihoods, land tenure and forest governance are key issues to be considered in future deliberations under the climate change regime.

The increasing need for agricultural land might result in intensified land–use conflicts as the production of bio-energy is competing with the production of food and with the production of other forest goods and services including the conservation of forest biodiversity. This dynamic would also affect the livelihoods of indigenous and local communities and small scale forest owners. Thus, it is important that both public and private sectors address these challenges to ensure responsible and sustainable production and consumption patterns.

In order to prevent negative impacts on forest biodiversity, contributions from the forest sector to international efforts in the development of sustainability standards for bioenergy production should be considered. Furthermore, the expansion of biofuel production and

consumption would also require clear and well enforced land-use regulations, along with adequate policies to prevent further loss of forest land and forest biodiversity.

During the last decades a number of successes related to biodiversity conservation have been achieved, for example, protected area networks cover now roughly 11 % of the planet's forests. Although the area of forests designated for the conservation of biodiversity is increasing, there is a high percentage of protected areas with deficiencies in management effectiveness, especially in countries with a low human development index. This indicates that governance structures and management capacities are often not adequately developed to effectively conserve biological diversity. Figures on funding gaps also indicate the need for enhancing sustainable financing of protected forest areas. This would support enhanced law enforcement and participatory approaches, thus clarifying land tenure and balancing conflicting interests between local and indigenous communities and the management of protected forest areas. Furthermore, attention should be given to the economic valuation of goods and services coming from protected forest areas. Discussions under the UNFF AHEG on the means of implementation should address this aspect when considering a voluntary global financial mechanism/portfolio approach/forest financing framework.

The complexity of the issue of forest biodiversity conservation demands cooperation from all sectors involved at different levels. Biological diversity in forests is not only affected by conservation policies and forest management regimes. A number of issues is beyond the forest sector's control and policies and management actions in several other sectors also have consequences for forests and their biodiversity. The analysis shows that the conservation of biodiversity in SFM requires effective cross-sectoral coordination of policies at national and international levels. This means that SFM implementation, which is supportive of biodiversity goals, should be integrated in other sectors.

At the national level, more than 130 countries have initiated nfps and about 160 countries have developed NBSAPs. However, links between these two planning frameworks are often not adequately established. This might be a symptom of the fact that environmental and forestry issues are often dealt with by separate agencies. Different analyses of experiences in developing and implementing nfps and NBSAPs strongly indicate that more inter-agency collaboration is needed and that more commitment is required within governments to ensure coherent and effective policy implementation. In the absence of such cross-sectoral cooperation and communication between different relevant departments, policy-makers tend to become inwardly focused on their sector and do not consider impacts on other sectors.

The analysis suggests that strengthening efforts of sector agencies in developing an outward-looking attitude and modifying policies through an adaptive approach in procedural policy instruments, such as nfps are opportunities to improve cross-sectoral synergies. In this context building better capacity to monitor forest biodiversity, use information tools, including criteria and indicators, and agree on common definitions of terms is necessary. Furthermore, stakeholder participation and transparency are two essential steps in addressing governance problems and enhancing synergies between sector policies. Such factors should be addressed and respective activities carried out through the NLBI.

The analysis also shows that in implementing nfps only limited reforms can be carried out without regard to other sectors and overall trends in the society. If the general approach proposed in the nfp concept is not embraced by political leadership, there is a limited chance that the forest sector alone could implement them. In this context, the analysis of experiences, trends and challenges in the conservation of forest biodiversity suggests that, in order to be successful, nfps and NBSAPs need to be coherent and interlinked with national sustainable development strategies, national poverty eradication strategies as well as national climate change mitigation and adaptation strategies, including National Communications in the framework of the UNFCCC. In addition, there should be increased coordination between national focal points of UNFF, UNFCCC, CBD, UNCCD and other relevant actors.

At the international level, the lack of cross-sectoral coordination has resulted in an increasingly fragmented forest agenda. This fragmentation and missing cross-sectoral coordination also constitutes a major constraint for the successful implementation of international commitments promoting biodiversity conservation in SFM. That confirms the need for enhanced synergies in policy development and implementation and coherent actions at all levels. Based on the mandate to provide a global framework for forest policy implementation, coordination and development and recalling its principal functions the UNFF could go beyond information-sharing and deepen substantive networking among international actors by developing respective initiatives and mechanisms and by liaising with governing bodies of relevant international organisations, institutions and instruments.

A work plan with targeted joint activities between the secretariats of UNFF and CBD, as brought forward by CBD Parties in decision IX/5, could be a good opportunity to strengthen international cross-sectoral cooperation and to commonly approach the implementation of commitments, as well as emerging issues that affect sustainable forest management and the conservation of forest biological diversity.

List of Abbreviations

AHTEG	Ad Hoc Technical Expert Group
ASEAN	Association of Southeast Asian Nations
ATO	African Timber Organization
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CITES	Convention on International Trade of Endangered Species of Wild Flora and Fauna
CMS	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
CH ₄	methane
CO	carbon oxide
CO ₂	carbon dioxide
COP	Conference of the Parties
CPF	Collaborative Partnership on Forests
CIFOR	Centre for International Forestry Research
COMIFAC	Central African Forest Commission
ECOSOC	Economic and Social Council of the United Nations
FAO	Food and Agricultural Organization of the United Nations
FLEG	Forest Law Enforcement and Governance
FLEGT	Forest Law Enforcement, Governance and Trade
FLR	forest landscape restoration
FONAFIFO	Fondo Nacional de Financiamiento Forestal
FRA	Global Forest Resources Assessment
FSC	Forest Stewardship Council
GEF	Global Environment Facility
GFIS	Global Forest Information Service
GFM	Global Forest Map
GHG	greenhouse gas
GISP	Global Invasive Species Programme
GMTs	genetically modified trees
Gt	Giga tons
ha	hectares
HDI	Human Development Index
IPCC	Intergovernmental Panel on Climate Change
IFF	Intergovernmental Forum on Forests
IPF	Intergovernmental Panel on Forests
ITTO	International Tropical Timber Organization
IUCN	IUCN - The World Conservation Union
IUFRO	International Union of Forest Research Organizations
JI	Joint Implementation
km ²	square kilometre
LULUCF	Land use, land-use change and forestry
m ³	cubic metre
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MEA	Millennium Ecosystem Assessment
MEE	management effectiveness evaluation
MYPOW	multi-year programme of work

NBSAPs	National Biodiversity Strategies and Action Plans
nfps	national forest programmes
NGOs	Non-Governmental Organisations
NLBI	Non-Legally Binding Instrument on All Types of Forests
NTFPs	non-timber forest products
NWFPs	non-wood forest products
OECD	Organisation for Economic Co-operation and Development
PEFC	Pan-European Forest Council
POW	programme of work on forest biological diversity
PROFOR	Program on Forests
Ramsar	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)
RAPPAM	Rapid Assessment and Prioritization of Protected Areas Management
REDD	reducing emissions from deforestation and degradation
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SFM	Sustainable Forest Management
TFLET	Programme on Tropical Forest Law Enforcement and Trade
UNCCD	United Nations Convention of Combating Desertification
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFF	United Nations Forum on Forests
UNFF8	The eight session of the UNFF (New York, 20 April - 1 May 2009)
UNFCCC	United Nations Framework Convention for Climate Change
US\$	US dollars
WCMC	UNEP World Conservation Monitoring Centre
WHC	World Heritage Convention
WWF	World Wide Fund for Nature

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