# 4. Have forests been sustainably managed?



## Sourcing and legality aspects

**Origin**
Where do the products come from?

**Information accuracy**
Is information about the products credible?

**Legality**
Have the products been legally produced?

## Environmental aspects

**Sustainability**
Have forests been sustainably managed?

**Special places**
Have special places, including sensitive ecosystems, been protected?

**Climate change**
Have climate issues been addressed?

**Environmental protection**
Have appropriate environmental controls been applied?

**Recycled fiber**
Has recycled fiber been used appropriately?

**Other resources**
Have other resources been used appropriately?

## Social aspects

**Local communities and indigenous peoples**
Have the needs of local communities or indigenous peoples been addressed?

# 4. Have forests been sustainably managed?

The movement for sustainable procurement of wood and paper-based products is driven to a large extent by the concern for how forests are affected by wood production. This concern has two major aspects:

- **Sustainability** – the balance of economic, social and environmental demands on the forest landscape. The maximization of wood production and minimization of cost should not upset the environmental and social balance of the landscape, either by removing trees at a quicker rate than they grow back or by paying insufficient attention to environmental or social concerns.
- **Forest conversion and land-use change** – the forest can change drastically after logging. It may be redesigned for tree production in a way that is significantly different from the forests that would naturally occur, or the forest can be converted to some other purpose that prevents trees from growing back.

**Sustainable forestry**

Sustainable Forest Management (SFM) is a management regime that integrates and balances social, economic, ecological, cultural, and spiritual needs of present and future generations (United Nations, 1992). Essential aspects of SFM include the following:

- **Economic** – the capacity of the forests to attract investment and support economically viable forest uses in the present and the future is undiminished. The forest is not used beyond its long-term capacity for production of wood, and non-wood forest products.
- **Social** – include a variety of aspects such as:
  - The rights of indigenous peoples and local communities are respected and protected
  - Forest workers are healthy, safe, and their rights are protected (e.g., freedom of association, right to bargain, child labor, forced labor, equal remuneration and non-discrimination)
  - Local communities, including indigenous peoples, benefit economically from forest management
  - Sites of religious, spiritual, archaeological, historic, as well as of aesthetic and recreational value are preserved.
- **Environmental** – forest use protects biodiversity (ecosystems, species, genes and ecological processes) and the capacity to maintain ecosystem processes and services such as watershed protection, pollination, protection against mudslides, aesthetic beauty, carbon storage, etc.

The result of different ways to balance these trade-offs is illustrated in Figure 5.

There are various approaches, positions, standards, and definitions of what SFM means and what specific management measures it requires. There are also various methods to measure progress towards SFM. Depending on the way their authors understand the concept and the management objectives, SFM standards for the same forest can be different. Regional standards for SFM can legitimately be somewhat different from one another, reflecting differences in forest types, legal frameworks, social conditions, and other factors. Mainstream standards for SFM differ on the following issues:

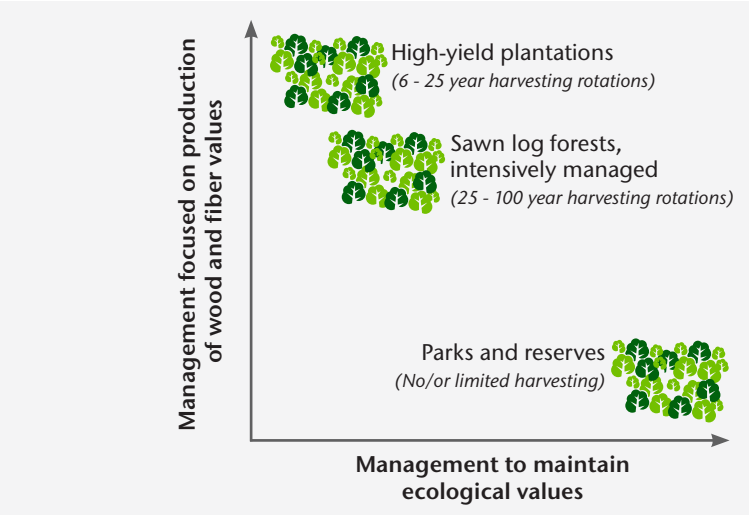
- **Clearcutting** – SFM standards, including CSA, FSC, PEFC and SFI, recognize clearcutting as consistent with SFM in the right forest ecosystems. Clearcutting can accomplish the following:
  - It mimics some of the natural disturbance dynamics of the forests (e.g., fire, wind blow downs, insects)
  - In some ecosystems, it allows regeneration and rapid growth of certain tree species
  - It costs less, making forestry more economically viable
  - It provides safer working conditions for loggers.

However, all SFM standards also recognize there is no single harvesting method suitable for all forest ecosystems.

- **Plantations** – plantations can focus production on smaller but more intensively managed areas. All SFM standards recognize plantations as being consistent with SFM under certain conditions; conditions may include considerations based on the ecological systems of the place, and the availability of land free from conflicts with other users.
- **Chemicals** – most standards allow controlled and appropriate use of chemicals (pesticides and fertilizers). Some standards prohibit the use of chemicals.
- **Genetically Modified Organisms (GMOs)** – some standards strictly prohibit the use of GMOs, while others will allow the use if and when legally available. At least 24 tree species have been known to have been the subject of transgenic research (for a list of species see WWF, 1999). In North America, however, no GM trees have been deregulated for commercial use.

Forest certification schemes define SFM through their respective standards (Table 3). All types of forests can be sustainably managed, from primary or natural forests to intensively managed forest plantations (Box 6).

### *Figure 5. Conceptual trade-offs between economic and ecological values*




*Areas managed intensively and exclusively for wood or fiber production (y-axis) will generally have fewer ecological values; forest areas managed exclusively for their ecological values (x-axis) will provide less economic value. Graphic based on Dyck (2003).*

### Factors to consider about SFM

- **Forest land can be sustainably managed without being certified by a forest certification system. Producers may not pursue forest certification if they perceive the costs of the process as outweighing the price premium offered for certified products.**
- **"Legally harvested" does not necessarily mean "sustainably produced" or "sustainably managed" because laws are sometimes insufficient to guarantee SFM, or are inadequately enforced.**

**Both major certification schemes are developing methods to assess the risk that wood from non-certified sources has been produced in an unacceptable way, see the section on inclusion of non-certified wood in Table 1.**

## Table 3. How major international certification schemes address selected aspects of SFM

| | Forest Stewardship Council (FSC) | Programme for the Endorsement of Forest Certification Schemes (PEFC) |
|---|---|---|
| **Social issues** | Four principles of the FSC system include various social concerns: tenure and use rights and responsibilities, indigenous people's rights, community relations, and workers' rights. Principle related to high conservation value forests (HCVF) also addresses social aspects for areas of archaeological, historical or cultural value. Standard-setting processes at the national and sub-national level are conducted in a transparent way and involve all interested parties. | Requires compliance with ILO core conventions. Pan-European Operational Level Guidelines (PEOLG) criteria and indicators address issues of occupational safety and health as well as accessibility to recreation and maintenance of sites with cultural or spiritual values. ATO/ITTO criteria and indicators for SFM require that legal and customary rights of local populations with respect to ownership, use and tenure are clearly defined, acknowledged and respected, as well as engagement with informed stakeholders (PEOLG, ATO/ITTO Principles, criteria and indicators for SFM of African natural tropical forests). |
| **Special places** | Principle 9 addresses high conservation value forests (HCVF), which are areas to be managed in such a way that these values are maintained or enhanced. HCVF include:<br>• Forests that contain globally, regionally, or nationally significant concentrations of biodiversity values<br>• Globally, regionally, or nationally significant large landscape level forests<br>• Rare, threatened or endangered ecosystems<br>• Forest areas providing basic services of nature in critical situations<br>• Forest areas fundamental to meeting basic needs of local communities<br>• Forest areas critical to local communities' traditional cultural identity | Forest management should maintain or enhance biodiversity, and protect soil and water. Sites of historical or spiritual significance should be respected and protected as specified by international guidelines and standards (PEFC, 2006 D).<br><br>Different requirements specified by international standards, criteria and indicators and requirements for SFM, for instance:<br>PEOLG Criterion 4.2i – special key biotopes in the forest such as water sources, wetlands, rocky outcrops and ravines should be protected or, where appropriate, restored when damaged by forest practices. |
| **Forest plantations** | Principles 6 and 10 of the FSC principles address forest plantations. Certified forest plantations should meet a set of requirements concerning:<br><br>(i) representation on landscape;<br>(ii) time of establishment; and,<br>(iii) design of the management blocks (i.e., blocks promote biodiversity).<br><br>Forest conversion to plantations or non-forest land uses should not occur except in circumstances where conversion entails a very limited portion of the forest management unit, does not occur in high conservation value areas, and will deliver long-term conservation benefits. | Management standards for forest plantations are to be compliant with the International Tropical Timber Organization and the PEOLG (PEFC, 2006D). |
| **Chemicals** | Principle 6 of FSC addresses chemicals. Chemicals should be minimized. Integrated Pest Management (IPM) is the preferred approach, i.e., to minimize chemical use through the use of alternative prevention and biological control techniques.<br><br>Documentation, monitoring, and control are required, and certain chemicals are banned. | Use of pesticides and herbicides should be minimized, used in controlled manner, and take into account appropriate silvicultural alternatives and other biological means. Compliance with PEOLG, ATO/ITTO criteria and indicators for SFM, as well as various ITTO guidelines for SFM (PEFC, 2007). |
| **Clearcuts** | Principle 6 of FSC addresses clearcuts. Restrictions on size and location vary among national/regional standards as long as ecological functions and values are maintained intact, enhanced or restored. | Management plans – including clearcutting – should be based on legislation as well as existing land-use plans and adequately cover forest resources. Regeneration, tending, and harvesting should be carried out in time and manner that do not reduce the productive capacity of the site (MCPFE, 1998). |
| **GMOs** | Use of GMOs is prohibited; addressed in Principle 6 of FSC. | GMOs can not be considered as part of certified material (PEFC Council General Assembly held on October 2005). |
| **Exotic species** | Addressed in Principle 6. Exotic species are permitted, but not promoted. Careful monitoring is required to avoid adverse environmental impacts. | As required by PEOLG, native species and local provenances should be preferred where appropriate. Introduced species, provenances or varieties producing negative impacts on ecosystems and on the genetic integrity of native species and natural provenances should be avoided or minimized as should those not thoroughly evaluated (MCPFE, 1998). |

***Source for FSC information is FSC (1996). This table provides an overview of the general characteristics of these two systems. This table is NOT meant to be an exhaustive comparison. A list of references to more detailed comparisons can be found in the section on additional resources.***

## Box 6. Plantations

The increasing demand for wood and paper-based products will likely be met, at least in part, through the establishment of new forest plantations. The area of forest plantations worldwide has been increasing to reach 140 million ha in 2005. Slightly less than half of the world's plantations are in Asia while exceptionally fast increases were experienced in North America, Central America, Oceania and South America between 1990 and 2000 (FAO, 2006). This trend is expected to continue, especially in developing countries. Forest plantations currently make up 5% of world's forest cover, but account for 35% of total global industrial wood production. There are advantages and disadvantages that need to be considered when sourcing from forest plantations.

Planted forests (plantations) may not provide the same ecosystem services natural forests provide, but they can play a positive role in other regards:

- By producing wood more efficiently, they may allow other natural forests to be managed for other forest values.
- When established on previously degraded sites they may recover some ecosystem functions and services. Increased recovery of degraded lands will play an important role in meeting future demand for wood and paper-based products and services including carbon sequestration and/or crops for fuels.

However, when forest plantations reduce the production costs for timber, products from natural forests may be at a disadvantage. If natural forests become less economically viable, it could cause owners to convert their lands to other more financially attractive land uses.

### Advantages and disadvantages of plantations

| Advantages | Disadvantages |
|---|---|
| Forest plantations can return degraded or worn out lands to productive use and protect soil from erosion. | There is often limited biodiversity if the forest is managed in single species plantations, resulting in reduced wildlife habitat and ecosystem value. |
| The rapid growth of forest plantations can produce more wood, faster, requiring less land to produce a specified amount of wood. | Diseases and pests which target a particular tree species can have devastating impacts in single species plantations. |
| Forest plantations enable landowners to take advantage of the newest forest technology and genetics. This results in greater yields and better prices, strong incentives for private landowners to continue to practice forestry on their lands. | Forest plantations often receive higher levels of inputs such as fertilizer and chemicals to control vegetative competition. Run-off, overspray and groundwater contamination can be issues if these practices are not carried out correctly. |
| Wood harvested from forest plantations is often very uniform in terms of species and size, thereby improving processing and manufacturing efficiency. | Some forest plantations are established using non-native species. These plantations may not provide suitable habitat for local wildlife. Trees replacing grazing land may also adversely affect groundwater levels. If allowed to escape off-site, some non-native species may out-compete local tree species for available resources, and become a "weed" or invasive species. |
| Focusing wood production in fast-growing forest plantations can allow other native/natural forests to be managed for other uses such as biodiversity, non-wood forest products, and aesthetics. | Rights of local communities and indigenous peoples may be ignored. Forest plantations often take over large areas of land that become unavailable to other users (e.g., fuel-wood collection, non-wood forest products) and can distort income distribution in households and communities. |
| Greater economic value of plantations can keep forest land in forest use, where a natural forest may not be economically sustainable. | Clearance of natural forests to establish plantations. |

The two principal concerns about forest plantations are:

1. They may replace natural forest areas or areas in the forest landscape with unique qualities.
2. They may not be established in compliance with local laws regarding land occupation, and with authorization of local and indigenous peoples.

*Sources: Boyer, 2006; FAO, 2007B; Nair, 2001.*

## LAND-USE CHANGE AND FOREST CONVERSION

Forests are naturally dynamic ecosystems. Natural processes (e.g., fire, flood, wind, earthquakes, mortality caused by insects, outbreaks of diseases, and the simple aging of trees) affect the composition and structure of all forests. Anthropogenic influences also change forest ecosystems, often in more dramatic and permanent ways. It is important to distinguish two different types of significant forest change, which are sometimes confused:

- Land-use change
- Forest conversion.

Land-use change, i.e., deforestation, reduces the area under forest. The United Nation's Food and Agriculture Organization (FAO) defines deforestation as "The conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10 percent threshold" (FAO, 2001). Deforestation occurs when forest areas are transformed to other land uses such as:

- **Agriculture:** this includes shifting cultivation (traditional and colonist shifting cultivation), permanent cultivation (subsistence or commercial cultivation), and cattle ranching (small and large-scale cattle ranching). Agricultural expansion can replace native forests with pasturelands and crops. Palm oil, soy crops, and likely fuel crops in the near future, are considered the leading proximate cause for forest land use change in the tropics.
- **Human settlement:** urban development, colonization, transmigration and resettlement (spontaneous transmigration, estate settlement, industrial settlement, urban settlements).
- **Infrastructure:** transport infrastructure, market infrastructure (mills, food markets, storage, etc.), public services (water, sanitation), hydropower, energy and mining infrastructure.

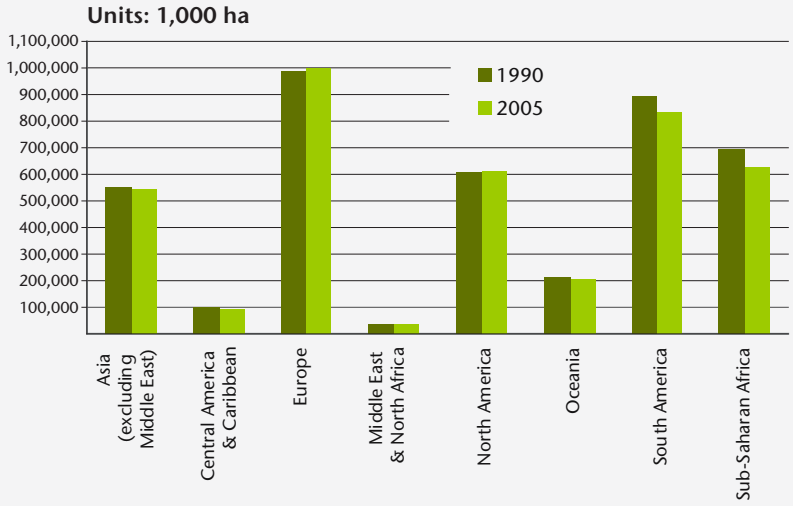
Forest conversion happens when a natural forest is transformed into a highly cultivated forest, often with introduced tree species and control of the hydrological and nutrient regime with a focus on wood production.

FAO's definition of deforestation specifically excludes areas where the forest is expected to regenerate naturally or with the aid of forest management measures following harvesting.

Over time, a significant amount of the world's forest lands have been converted to other land uses. In the northern latitudes most of this change in land use occurred in the past. In some cases natural forests have reestablished themselves in these areas; in others forests have been planted. The managed forests we see today are often influenced by historical land uses, such as grazing or agriculture.

In the tropics, a major concern is the high rate of continued conversion of forests to other uses (Figure 6).

### *Figure 6. Forest extent in 1990 and 2005*




*Source: Earth Trends Query (www.earthtrends.org). Forest coverage in South America has declined by almost 60 million ha in 15 years. In North America and Europe forest cover increased by almost 4 and 12 million ha respectively in the same time-period.*

The causes of forest land use change vary by region, and even within a region. It is often a complex combination of intertwined factors and circumstances involving more than a single industry. Table 4 presents a general summary of some of the causes, drivers, and factors associated with forest land use change.

Commercial extraction of wood-based products, in combination with other factors and economic activities, has been linked to forest land use change. For instance:

- In Asia, logging concessions are often harvested and converted to plantations (mostly oil palm) because this change in use is usually less expensive than the selective logging needed to maintain the native forest. Under current economic and political incentives, there are faster and more profitable investment returns in palm oil plantations, and there is poor law enforcement and planning.
- In Central Africa and South America, logging companies open roads to extract/transport timber. These roads open the way for encroachment. An opening in the forest, combined with lack of enforcement and pressure from human populations, can result in change in use to subsistence farming or other agricultural operation.

Converting a forest into a forest plantation affects the balance of ecosystem services (e.g., it may eliminate species, affect erosion control and/or water supplies while increasing the production of wood), but converting forests to non-forest uses such as urban settlements completely eliminates the forest ecosystem. Forests deliver a variety of ecosystem services and benefits, but many of these are not recognized under the current economic and political situation and do not generate any revenue to the forest owner. Often the value of an intact natural forest or a standing forest or a forest plantation can be greater to society than the value of a converted forest area.

## Table 4. Factors underlying forest land-use change and conversion in the tropics

| Factors | Underlying causes |
|---|---|
| Economic | Market growth and commercialization: rapid market growth of the export-oriented sector, increased market accessibility, growth of industries, lucrative foreign exchange earnings, growth of demand for goods and services.<br><br>Economic structures: large individual speculative gains, poverty and related factors, economic downturn, crisis conditions.<br><br>Urbanization and industrialization: growth of urban markets, rapid build-up of new forest-based (or related) industries.<br><br>Special economic parameters: comparative advantages due to cheap, abundant production, factors in resource extraction and use, and price. |
| Policy and institutional | Policies: taxation, credits, subsidies, licenses, concessions, economic development, population (migration), and land ownership policies.<br><br>Institutional factors: corruption, poor performance, mismanagement, etc.<br><br>Property rights regime: insecure ownership, rush to establish property rights, titling, consolidation, open access conditions, etc. |
| Technological | Agro-technological changes, technological applications in the wood sector, and other production factors in agriculture. |
| Social and cultural | Social unrest and disorder (war, civil war, etc.), health and economic conditions, government policy failures. Cultural factors include concern (or lack of) towards forest protection and sustainable use. |
| Demographic | Population growth and increasing demand for products, food, space, etc. |
| Other | Soil quality, water availability, and slope, topography, and vegetation types. |

(Based on Geist and Lambin, 2001).

### Factors to consider regarding land-use change and forest conversion

**In procuring wood and paper-based products from forest areas that are being legally converted to another land use (e.g., as part of governmental land zoning policies), it is advisable to fully understand the circumstances as the risk of corruption, illegalities, violations of indigenous people's rights, and other issues may be high.**

**It is advisable to ensure that those involved in such a change process do it in a way that is transparent, mindful of the needs and perspectives of different local stakeholders, well planned and informed, and with safeguards and measures to remedy negative impacts. Some of the aspects described under Questions 1 and 2, and the tools presented there may be useful and applicable to these situations.**

## SELECTED RESOURCES: SFM, LAND-USE CHANGE AND FOREST CONVERSION

**Procurement requirements**

| | |
|---|---|
| Danish Government Procurement Policy for Tropical Forests (under review) | Draft criteria address seven thematic elements for SFM, including protection and productive functions of forest resources and forest health and vitality. Previous guidelines considered FSC to provide adequate guarantees for sustainably produced tropical wood. |
| German Government Procurement Policy | Requires that wood-based products be harvested from verifiable legal and sustainably managed forest operations. Certificates issued from FSC and PEFC are recognized as guarantees of SFM but the systems can be excluded if sustainable management cannot be guaranteed. |
| Japanese Government Procurement Policy | Requires that timber be harvested under a sustainable management regime, and verified through various instruments such as forest certification systems (CSA, FSC, Japan's Sustainable Green Ecosystem Council, LEI, MTCC, PEFC and SFI), codes of conduct of wood industry associations, and self-verification mechanisms. |
| Public procurement policies for forest products and their impacts | Reviews how different public procurement policies define or address sustainability (e.g., through certification systems, providing definitions and guidance, adopting third-party definitions, etc). Provides an analysis of the impacts of public procurement policies on the forests and forest certification. |
| Timber Trade Federation Responsible Purchasing Policy | Provides guidance and advice to its members to evaluate compliance with sustainability requirements of the UK central government procurement policy. Members must not trade wood from forests being converted to plantations or non-forest land uses. |
| LEED | Promotes SFM through the use of FSC certification. |
| Green Globes | Scores whether wood-based products originate from operations that are certified by the American Tree Farm System, CSA, FSC and SFI. |
| SFI Procurement Objective | Program participants' procurement programs are expected to promote SFM principles. |

**Resources to assess requirements**

| | |
|---|---|
| CPET | Provides advice and guidance to comply with UK central government requirements for sustainability, including a framework to assess compatibility of certification systems and other types of evidence. Recognizes CSA, FSC, PEFC, and SFI certification as evidence of sustainability. |
| CEPI Certification Matrix | Compares certification systems' conformance with international governmental and non-governmental forestry principles. |
| Paper Profile | Provides information on whether or not the mill receives wood from certified forests, and under which certification systems. |
| FCAG | Includes criteria and requirements to assess compatibility with globally applicable SFM principles and continued improvement of forest management. Assesses whether or not certification systems' provisions for forest plantations ensure that plantations do not lead to the conversion of critical natural habitats. |
| GPN | Prefers products using sustainably produced renewable natural resources, including certified products. |
| Good Wood. Good Business guide | Promotes sourcing from verifiable sustainably managed forests. Provides an overview of international initiatives to develop criteria and indicators for assessing, monitoring and reporting on SFM, as well as certification systems. Definition of unwanted wood includes wood from forest conversion projects, dam clearance projects and others. |
| wood for good | Promotes forest certification (CSA, FSC, PEFC, and SFI). |
| EPAT® | Rates fiber from operations certified under CSA, FSC, PEFC, SFI, and other national and international certification systems. |
| WWF GFTN | Promotes credible certification as a tool for improving forest management. Provides advice on options for addressing land-use change issues. |
| WWF Tissue Scoring | Rates companies' commitment to eliminate all sourcing of materials from the conversion of natural forests. Gives preference for buying wood from FSC-certified plantations and companies committed to improvement of management that enhances biodiversity in plantations and in the adjacent areas. Scoring criteria also considers whether or not companies have a commitment to make stepwise progress towards certification. |
| WWF Paper Scorecard | Rates percentage of FSC-certified fiber. |
| WWF Guide to buying paper | Provides background information about SFM and links to additional resources; promotes forest certification as means to avoid sourcing raw materials from areas that have been converted; showcases company sourcing certified materials. |