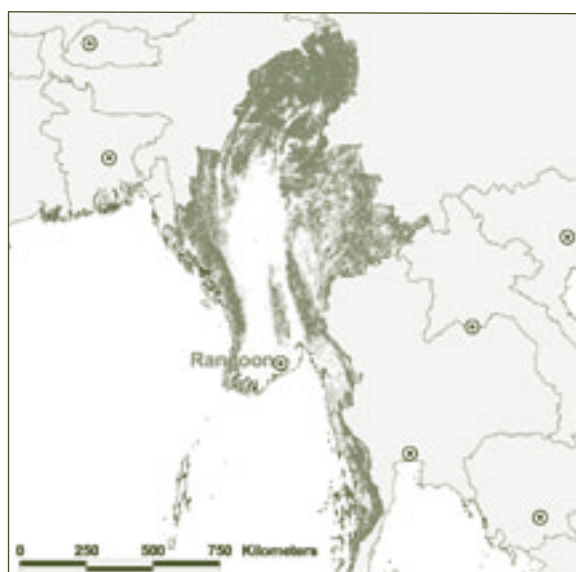


# MYANMAR



\*For legend see page 58

## Forest resources

Myanmar has a land area of 67.7 million hectares and a population of 49.5 million people. It lies between India and Bangladesh to the west and Thailand and China to the east and stretches from a latitude of 7° north in the Kra Isthmus to 20° north and the peak of Hkakabo Razi (5,881 m) in the Himalayas. Rainfall varies from 500 to 5,000 mm and there is a marked dry season. The total forest area in Myanmar is estimated to be 34.4 million hectares (<sup>a</sup>, FAO 2005a).

**Forest types.** Because of its wide geographical spread, Myanmar's forests are very varied. Important forest types are: evergreen (16% of total forest cover), mixed deciduous forest (40%), dry forest (10%), deciduous dipterocarp forest (5%), hill and temperate evergreen forest (26%) and tidal swamp forest (4%)<sup>a</sup>. Some of Myanmar's forests lie outside the tropics.

**Dynamics of forest resource change.** Myanmar lost an estimated 5.2 million hectares of forest between 1990 and 2000, an annual deforestation rate of 520,000 hectares (1.4%) (FAO 2005a). There has also been apparent degradation of remaining forests; the average volume of woody material in the growing stock fell from 145 m<sup>3</sup> per hectare in 1990 to 33 m<sup>3</sup> per hectare in 2000, and the quantity of above-ground biomass fell from 217 tonnes per hectare to 57 tonnes per hectare during the same period (FAO 2001).

**Permanent forest estate.** The natural-forest PFE comprises an estimated 13.0 million hectares (Table 1); 62% of the PFE's boundaries have been demarcated<sup>a</sup>. Within the PFE, 9.7 million hectares are designated as production forest, 8.3 million hectares being mixed deciduous and 1.4 million hectares evergreen forests<sup>a</sup>.

**Planted forests.** The area of planted forests in 2000 was an estimated 710,000 hectares, 35% of which (291,000 hectares) was teak (*Tectona grandis*) (FAO 2001). Agro-industrial plantations include 110,000 hectares of rubber (*Hevea brasiliensis*) (ibid.).

## Institutional arrangements

**Forest tenure.** All forests are owned by the state; nevertheless, private and communal tenure systems also exist (FAO 2001). They are designated as reserved forests and public or unclassified forests; commercial timber and non-timber products are extracted from both classes. Particular rights apply to teak; according to the 1992 Forest Law (Chapter III), "a standing teak tree wherever situated in the state is owned by the state".

Table 1 Tropical PFE

Estimated total forest area (million hectares)	Total closed natural tropical forest ('000 hectares) Source: derived from FAO 2001	PFE ('000 hectares) <sup>a, *</sup>			
		Production		Protection	Total
		Natural	Planted		
34.4	32,700	9,700	710	3,300	13,710

\* Excludes Myanmar's non-tropical forest

**SFM policy framework.** Myanmar has undertaken some actions to define a framework for SFM. For example, it developed C&I for SFM in 1996 based on the ITTO C&I.

**Forest policy and legislation.** Myanmar, formerly known as Burma, was once a province of British India, and the 1894 Indian Forest Policy guided forest management until the Burma Forest Act was enacted in 1902. This was in use until 1992, when a new forest law was promulgated; this emphasizes the importance of the participation of people in the conservation and sustainable utilization of forest resources. Other regulations such as the Forest Rules, 1995, and the National Code of Practice for Forest Harvesting, 1998, also help guide forest management. A new national forest policy was developed in 1995; it emphasizes the need to adopt SFM, establish protected areas for wildlife protection and biodiversity conservation, undertake sound land-use planning, privatize the wood-based industry, and promote people's participation and community forestry.

The mobilization of funds for forestry development is mainly the responsibility of government. Despite having a long-term national forest action plan and district forest management plans, few resources have been allocated to enable programs to be implemented. Official overseas development assistance is low: US\$126 million in 2003 (UNDP 2005).

**Institutions involved in forests.** The Ministry of Forestry has the primary responsibility for implementing the forest policy, for the administration and management of the forestry sector and, since January 2005, for environmental protection (Global Witness 2005). The minister may constitute the following categories of reserved forest by demarcation on land at the disposal of government: commercial extraction reserve forest, local supply reserved forest, watershed or catchment reserved forest, environment and biodiversity conservation reserved forest, and other categories of reserved forest. The Minister may also declare specific areas as protected public forest. Various government agencies and government-sponsored NGOs play a role in forest management: the Planning and Statistics Department; the Forest Department; the Myanmar Timber Enterprise (MTE); the Dry Zone Greening Department; the National Commission on Environment Affairs; the Forest

Resource, Environment, Development and Conservation Association; the Forest Joint Venture Corporation Ltd; and the Timber Merchants' Association. The adoption of a market economy was first announced in September 1988, and many private timber companies became involved in timber industries. For teak, however, the MTE has a monopoly on harvesting, processing and export, and the private sector is not permitted to export logs of any species. With a view to stepping up the manufacture of forest products and to promote internal and external distribution, the Forest Products Joint Venture Corporation Ltd was established by the MTE, the Forest Department and private enterprises. In January 1995, the government formed a privatization commission to oversee the process of privatization and to ensure its successful implementation.

The level of decentralization is low and confined to the delegation of powers to parallel and vertical institutions. Privatization and private-sector involvement are still meagre.

Participation by civil society takes place through government-sponsored NGOs such as those listed above. Others, such as farmers' and women's income generation groups are being formed. This last initiative aims to benefit social well-being by raising off-farm incomes and helping advance SFM. International environmental NGOs are not active in Myanmar, nor are independent national advocacy NGOs.

## **Status of forest management**

### **Forests for production**

The total number of FMUs in Myanmar is 62, out of which 41 are dedicated to timber production. Thirty-four FMUs are actively managed for teak and other hardwoods covering an area of about 470,000 hectares<sup>c</sup>. In the natural teak forest, mature teak trees selected for harvesting are normally girdled and left standing for three years before felling and extraction. This is done to season the timber and make it buoyant, as logs are normally transported by floating them down rivers; in more accessible areas, mature teak trees are sometimes felled and extracted green. The Forest Department selects mature trees for harvesting while the MTE

**Table 2 Some commonly harvested tropical timber species for industrial roundwood (2001–03)<sup>a</sup>**

Timber species	Remarks
<i>Tectona grandis</i> (teak)	30–40% of logs produced
<i>Xylia dolabriformis</i> , <i>X. kerri</i> (pyinkado)	Associate of teak, found in varying proportions
<i>Pterocarpus macrocarpus</i> (padauk)	Associate of teak
<i>Terminalia tomentosa</i> (htauk kyant)	Associate of teak, found in varying proportions
<i>Millettia pendula</i>	From planted forests

is responsible for the actual harvesting of both teak and other hardwoods. The MTE operates 38 extraction and rafting agencies throughout the country. Most log-skidding is done by elephants<sup>a</sup>; they have been shown to do less damage to the forest than machines, and wastage is less. Mechanical extraction is not favoured as it is not considered economically feasible under the Myanmar Selection System (see below); it is only used in limited areas. So far, heavy equipment has been used mainly for road construction, the loading and unloading of logs, and for transportation.

The area harvested annually has, over the past five years, averaged about 411,000 hectares; 52% of logging areas are under management plans or harvesting schemes<sup>a</sup>. Logging is guided by the National Code of Practice for Forest Harvesting, which includes detailed guidelines for work such as: the alignment and construction of extraction roads, skid trails and stream crossings; the mapping of tree positions; climber cutting before felling; and the directional felling of selectively marked trees.

Forest management in general and teak management in particular have various constraints and problems. At present, timber extraction is concentrated on only a few species. This 'creaming' of the forest, if unabated, will lead to the devaluation of the forests in the long run through a decrease of valuable species. Other problems are: timber theft and the illegal logging of trees for commercial use; the extension of pasture land and swidden agriculture; and over-harvesting for firewood and charcoal. The political situation in remote areas creates an environment that allows wasteful and unplanned logging and possible illegal cross-border trade. The Forest Department is undertaking remedial

measures to conserve the natural forests – such as updating district-level forest management plans, surveys, boundary demarcation, fire protection, logging codes, forest reservation, and establishment of a PFE and community involvement, but lacks adequate resources, particularly to exercise control in remote areas (Global Witness 2003). Logging in Kachin state, on the border with China (and outside the tropics) has reportedly had serious environmental impacts (Global Witness 2005).

**Silviculture and species selection.** Silvicultural management of the natural forests dates back to 1856, when the Myanmar Selection System, a selection system for harvesting teak and other valuable hardwoods, was devised. If the prescriptions of this system were followed, trees of harvesting size would be marked selectively within the limits of the AAC calculated for each felling series according to the principles of sustained yield management. In accordance with the prescriptions of the system, various silvicultural treatments such as improvement felling, natural regeneration felling, thinnings in natural regeneration of teak, climber cutting, fire protection, etc are carried out in order to improve the naturally regenerating teak forests, protect the immature stock and assist it to attain a healthy maturity. Silvicultural tending is necessary to guarantee the sustainability of teak in Myanmar's multi-species and complex teak-bearing forests; in the absence of such tending, bamboo and light-demanding species will suppress teak regeneration. The extent to which such tending is carried out is not reported<sup>a</sup>.

Of 1,286 recorded tree species, 70 are commercially valuable (Global Witness 2005). In addition to the species listed in Table 2, commonly used timber

**Table 3 Management of the production PFE ('000 hectares)**

Total	Natural			Planted			
	Allocated to concessions/ under licence	With management plans	Sustainably managed	Total	With management plans	Certified	
9,700	n.a.	9,700 <sup>a</sup>	0	291 *	710	0	0

\* Semi-natural teak forests

species include *Adina cordifolia*, *Anogeissus* spp, *Bridelia retusa*, *Dalbergia oliveri*, *Dipterocarpus* spp, *Homalium tomentosum* and *Lagerstroemia flos-reginae*.

**Planted forest and trees outside the forest.**

Myanmar has a long tradition of raising planted forests; teak plantations were introduced in 1856 under a *taungya* system, and teak remains the main planted species in commercial timber plantations. Other commercial planted species include: *Xylia kerri* (pyinkado), *Gmelina arborea*, *Pterocarpus macrocarpus* (padauk), pines, acacias and eucalypts. The annual forest plantation program is now fixed at around 37,000 hectares (Forest Department 1999); Myanmar's 1995 forest policy stipulates that natural forests will not be cleared to make way for plantations, only supplemented by them. Tree-planting on a moderate scale is done to enrich degraded forest areas and there is some planting to complement natural regeneration. Since 1997, joint-venture and foreign companies have been allowed to establish their own plantations to meet the needs of their industries (ibid.). Timber from farm trees, home gardens and rubber plantations is also important in domestic timber supply.

**Forest certification.** So far no forests have been certified in Myanmar. There is a committee for timber certification, but information on its status and activities was not available for this report.

**Estimate of the area of forest sustainably managed for production.** All the production PFE is covered by management plans formulated by the Forest Department in cooperation with the MTE<sup>a</sup>, but information on the extent to which these management plans are implemented was not available. In mid 2005, 470,000 hectares of FMUs were actively managed for timber production<sup>c</sup>.

Insufficient information was available to estimate the area of natural-forest PFE being sustainably managed, but the 291,000 hectares of semi-natural planted teak that are considered to be so managed are treated as natural forest in Table 3.

**Timber production and trade.** Roundwood production in 2003 was an estimated 39.8 million m<sup>3</sup>, of which 35.6 million m<sup>3</sup> (90%) was fuelwood (FAO 2005b). Production statistics indicate an increase in the harvesting of Myanmar's forests. ITTO (1999, 2004, 2006 in prep.) estimated the total industrial tropical log production in 2003 at 4.24 million m<sup>3</sup>, up from 3.35 million m<sup>3</sup> in 1999 and 2.30 million m<sup>3</sup> in 1994. An estimated 1.0 million m<sup>3</sup> of sawnwood was produced in 2003, up from 298,000 m<sup>3</sup> in 1999. An estimated 1.28 million m<sup>3</sup> of logs were exported in 2003, up from 980,000 m<sup>3</sup> in 1999 and 602,000 m<sup>3</sup> in 1994 (ibid.). Major export destinations are China, Thailand and India (ITTO 2006 in prep.).

The value of Myanmar's exports of primary timber products amounted to US\$345 million in 2003, of which logs contributed US\$269 million (78%) (ITTO 2005). According to import data for China (ITTO 2003), 514,000 m<sup>3</sup> of tropical logs were imported from Myanmar in 2001, although Myanmar reported an export volume to China of 3,240 m<sup>3</sup> in the same year. Myanmar's policy is to reduce log exports gradually so as to promote downstream processing. However, due to a lack of infrastructure and appropriate technology, a complete ban on log exports is not likely for quite some time. Myanmar also exports downstream-processed, value-added products such as parquet and furniture.

**Non-wood forest products.** Many NWFPs are used locally and marketed. The most important are bamboo and rattan; others, such as cutch tree (extracted

**Table 4 Management of the protection PFE ('000 hectares)**

Total	Attributed to IUCN categories I-IV	Allocated for soil and water	With management plans	Sustainably managed
3,300 <sup>a</sup>	195	6,560 <sup>a</sup>	n.d.	n.d.

from *Acacia catechu*), tannin, honey and beeswax, pine resin and birds' nests, are also widely used. Forest recreation and ecotourism are important: eleven areas are set apart as recreation forest<sup>a</sup>.

### Forest for protection

**Soil and water.** The estimated area of forest managed primarily for soil and water conservation is 6.56 million hectares<sup>a</sup>. The catchments of 123 dams are protected; tree-planting has been carried out in some of these to prevent land degradation<sup>a</sup>. Local people are involved in protection works.

**Biological diversity.** Myanmar is one of the most biologically diverse countries in mainland Southeast Asia, with 7,000 plant species, 1,347 large tree species, 96 bamboo species and 841 identified species of orchid (Forest Department 2000). Forty mammals, 49 birds, 26 reptiles and 38 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 26 mammals, 37 birds and one plant are found in forests (IUCN 2004). Nine plants are listed in CITES Appendix I and 182 in Appendix II (CITES 2005).

The 1992 forest law and the 1995 national forest policy both emphasize a balanced approach to conservation and development and highlight environmental and biodiversity conservation. Consequently the old Wildlife Protection Act (1936) was replaced by the Protection of Wildlife, Wild Plants and Natural Areas Law in June 1994 in order to carry out biodiversity and environmental conservation more effectively. Further, Myanmar Agenda 21 has incorporated *ex situ* and *in situ* measures to protect biodiversity, including endangered species of flora and fauna<sup>a</sup>.

**Protective measures in production forests.** Protective measures in production forests are provided for in the guidelines for logging, road construction, pre- and post-logging operations, and the protection of river banks and road margins.

**Extent of protected areas.** The total area of protection PFE is an estimated 3.30 million hectares<sup>a</sup>. According to UNEP-WCMC (2004), 195,600 hectares of forest are in protected areas that conform to IUCN protected-area categories I-IV. The national forest policy has set a short-term goal of increasing the coverage of protected areas to 5% of the land area and a long-term goal of 10% (Global Witness 2005).

**Estimate of the area of forest sustainably managed for protection.** No details are available about the management status of the protection PFE (Table 4).

### Socioeconomic aspects

**Economic aspects.** About 30,600 people are employed by the government in the forest sector, including 1,400 professionals and 29,200 technical staff. Of these staff, 11,000 are in the Forest Department, 19,300 in MTE and about 300 in the Dry Zone Greening Department<sup>a</sup>. Overall, some 500,000 people are thought to be dependent on the forestry sector for employment; the contribution of forestry to GDP was an estimated 1% in 1997-98<sup>a</sup>.

**Livelihood values.** Some 38 million people are dependent on the forest for at least part of their livelihood; they have access to about 6.7 million hectares made available through the 'local supply working circle'<sup>a</sup>.

**Social relations.** In order to promote and facilitate community participation in managing the forests, 'community forestry instructions' were issued in late 1995. These emphasized the management of forests by rural communities through the protection of natural forest and the establishment of forest nurseries and forest plantations so as to enable such communities to meet their needs for fuelwood and small-diameter timber. The instructions also focus on the flow of benefits to those communities participating in forest management. More than 259 agreements have been made between the Forest Department and social groups<sup>a</sup>. However,

community forestry has a number of problems – especially with regards to tenure and the security of agreements reached with government agencies. Cross-border illegal timber trade has reportedly fueled ethnic tensions, entrenched power structures and created conditions under which local warlords can thrive (Global Witness 2005). The control of teak-planting by government also limits the profitability of community forestry.

## Summary

Myanmar once boasted an exemplary system of forest management, particularly in its large area of teak forests, but in recent decades there has been significant deforestation and forest degradation. Timber production almost doubled in the ten years to 2003, and the Forest Department lacks sufficient resources to fully implement the silvicultural system or enforce regulations, particularly in remote border areas. Community forestry also faces a number of challenges, such as the lack of decentralization in forestry administration. Nevertheless, about half the country is still forested and SFM remains within reach, given the surmounting of political, administrative and economic obstacles.

## Key points

- Myanmar has an estimated 13.0 million hectares of natural tropical forest in its PFE, of which 9.70 million are designated for production and 3.30 million for protection. Myanmar also has about 710,000 hectares of planted forests, 35% of which are teak.
- Many of Myanmar's forests are becoming degraded, exacerbated by a lack of law enforcement, particularly in remote regions.
- At least 290,000 hectares of semi-natural teak forest in the production PFE are being managed sustainably, but insufficient information was available to assess the management of the bulk of the production PFE. Nor could an estimate be made of the extent to which the protection PFE is so managed.
- A well-tested silvicultural system exists for Myanmar's teak forests, but the extent to which it is being implemented is unclear.

- The Ministry of Forestry has primary responsibility for implementing the national forest policy, which was instituted in 1995.
- Some of the most significant obstacles in the way of implementing SFM are institutional. These include chronic budget shortages affecting the Forest Department, very limited private-sector involvement, insufficient well-trained personnel, and a lack of effective participatory processes.
- Total production of industrial roundwood was an estimated 4.24 million m<sup>3</sup> in 2003.
- Myanmar has established protected areas and prepared plans for expanding the protected area system and for improving biodiversity conservation, but no information was available on implementation.

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