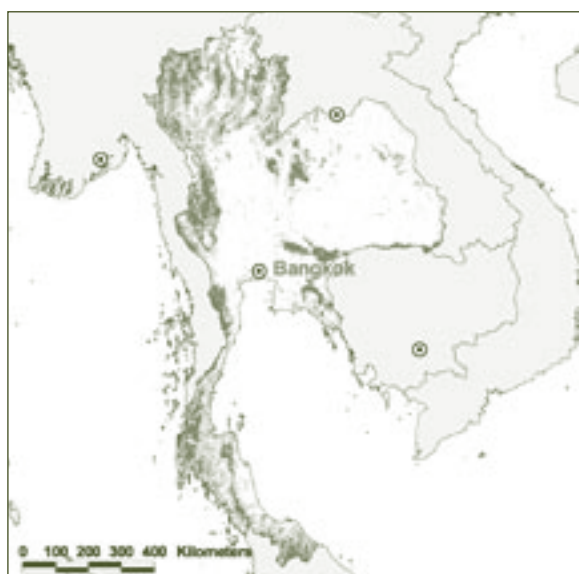


# THAILAND



\* For legend see page 58

## Forest resources

The Kingdom of Thailand is located in the southeastern part of continental Asia, bordered by Myanmar, the Lao People's Democratic Republic, Cambodia and Malaysia. It has a land area of 51.3 million hectares and a population of 63 million people. In the 1980s and 1990s, Thailand's economy was one of the fastest growing in the world, but this coincided with the rapid depletion of its natural resources. Estimates of forest cover range from 13.0 million hectares<sup>a</sup> to 14.8 million hectares (for 2000; FAO 2005a).

**Forest types.** The forests can be classified as: (i) evergreen forests with three sub-types – tropical rainforests, semi-evergreen forests and hill evergreen forests (43% of the forest area), dominated by species of the genera *Dipterocarpus*, *Hopea*, *Shorea*,

*Lagerstroemia*, *Diospyros*, *Terminalia*, and *Artocarpus*; (ii) pine forests, mainly of *Pinus merkusii* (2%); (iii) mangrove and coastal forests (2%), the main mangrove genera being *Rhizophora*, *Avicennia* and *Bruguiera* and the main beach genera *Diospyros*, *Lagerstroemia* and *Casuarina*; (iv) mixed deciduous forest (22%), the dominant species being *Tectona grandis* (teak), *Xylia kerrii*, *Pterocarpus macrocarpus*, *Dalbergia* spp and *Azelia xylocarpa*; and (v) dry dipterocarp forest (31%).

**Dynamics of forest resource change.** Forest covered over 60% of the land area in 1953, but by 2000 this had fallen to less than 30%. Between 1990 and 2000, the annual loss of forest cover was an estimated 112,000 hectares, a deforestation rate of 0.7% (FAO 2005a). Remaining forests are subject to a range of disturbances, including encroachment for agriculture, forest fires (an estimated 2.63 million hectares of mostly deciduous forest were affected by fire in the period 1996–2000<sup>a</sup>), refugees from neighbouring countries seeking living space, the development of infrastructure, and illegal logging.

**Permanent forest estate.** The area of PFE reported in 1991 was 23.5 million hectares, much of it already without forest cover. The most recent estimate suggests that this had shrunk by almost 50% to 13.0 million hectares in 2001<sup>a</sup>, 1.15 million hectares of the original PFE having been converted to agriculture, 8.3 million hectares to settlements and infrastructure and 1.1 million hectares to other uses<sup>a</sup>. The balance now available comprises about 10.1 million hectares of closed forest (the estimated PFE given in Table 1) and 2.84 million hectares of open forest. The production forest is now mainly planted forest on government land.

Table 1 PFE

Estimated total forest area (million hectares)	Total closed natural tropical forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>d</sup>			
		Production		Protection	Total
		Natural	Planted		
13.0–14.8	10,127	0	1,870*	8,260	10,130

\* Includes semi-natural planted teak

The security of the PFE in Thailand is somewhat problematic. The allocated areas keep changing, boundaries are not clearly demarcated and the land is subject to illegal occupation. The logging ban in 1989 (see 'forest policy and legislation') has not had the expected positive effect; it did little to limit environmental degradation (Pragtong 2000).

**Planted forests.** The total extent of planted forest in 2000 was an estimated 2.81 million hectares (FAO 2001); not all of this is in the PFE estimated in Table 1. In addition, there were about 2.1 million hectares of rubber plantations, an important source of timber (ibid.).

### **Institutional arrangements**

**Forest tenure.** All forests in Thailand are owned by the state, although all trees established on private lands are private property. The 1997 constitution recognizes the right and duty of traditional and other local communities to participate in natural resource management, although without changes to forest-related legislation it is unclear what this means in practice for forest management. There is an ongoing debate in Thailand about the rights of traditional and other local communities to access forests, including in protected areas. Rural people dependent on the forest and forest land have the right to collect certain NWFPs for their consumption and rural trade<sup>a</sup>. Some 'disturbed' state forests are available for long-term rent at a low charge for growing crops or planting trees<sup>a</sup>.

**SFM policy framework.** In the strict sense, there is no framework for SFM in Thailand, even though the country formally subscribes to the overall concept. Production forestry is concentrated in teak and rubber plantations and, for the time being, there is no comprehensive scheme to restore degraded forests to economic use.

**Forest policy and legislation.** Thai forestry is regulated by a number of legislative instruments: the National Forest Act of 1941, the Wildlife Preservation and Protection Act of 1960, the National Parks Act of 1961, the National Reserved Forests Act of 1964 and the Forest Plantation Act of 1992. A draft Community Forestry Bill has been under development and debate in Thailand for more than a decade, but as of September 2005 had not passed into law.

The national forest policy has been revised periodically, changing its focus to suit changing situations. The 1941 policy focused on timber production and dealt solely with the management of plantations and logging concessions in natural forests. The 1985 forest policy sought to establish the long-term coordinated management of forest resources, envisaging increasing the area of forest to 40% of the land area. With the imposition of the logging ban in 1989 the focus of forestry moved clearly towards conservation. The present forest policy was adopted in 1997, based on suggestions contained in the forest-sector master plan, which was completed in 1995. Reforestation and afforestation were seen as important initiatives for the future supply of wood. Implementation of the plan has, however, been hindered by several constraints, mostly institutional.

**Institutions involved in forests.** The Royal Forest Department (RFD) was established in 1896 as the sole agency for the administration and management of forest resources. The RFD is also responsible for the training of field staff and for forestry research. In 2003, the RFD had five technical bureaux, seven administrative divisions, 21 regional offices, 76 provincial forestry offices and 530 district forestry offices<sup>a</sup>. However, with recent changes in the focus of policy and the decentralization of forest administration (see below), the structure of the RFD has been rationalized. For example, the Forest Management Division, which was responsible for preparing timber harvesting plans, has been dissolved.

The 1997 constitution provides for the decentralization of federal powers and functions to local governments. The 1992 Tambon (local) Administration Act also gives greater roles to local administrations. Accordingly, tambon administrations will manage forests within their territories. Mechanisms for decentralization will include: community forest and buffer-zone management; small-scale forest plantations; and local responsibility for forest and forest-fire protection. Achieving a balance between the roles and functions of the RFD at the various levels and the tambon administrations represents a significant challenge.

Civil society was influential in the decision of the government to ban commercial logging in 1989 in the wake of destructive floods which occurred in the southern region of the country. In 1997, civil

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

Timber species	Remarks
<i>Hevea brasiliensis</i> (rubberwood)	Used in furniture manufacturing
<i>Tectona grandis</i> (teak)	Expensive cabinet wood
<i>Eucalyptus</i> spp	Cheaper utility wood
<i>Acacia</i> spp	Cheaper utility wood
<i>Pinus merkusii</i>	Medium-quality timber

society was also closely involved in the revision of the constitution, which expressed as a fundamental state policy the recognition of the rights of communities to participate in natural resource management (Contreras 2002). The Thailand Environment Institute, established in 1993, is the main domestic NGO that focuses on environmental management.

## Status of forest management

### Forest for production

In the past, Thailand followed a scientific approach to natural forest management under the prescriptions of forest management (working) plans, adequately supported by forest inventories. The last such inventory was undertaken in 1975. General management guidelines prescribed that deciduous teak forest should be managed under a 30-year felling cycle. The dry dipterocarp forest was to be managed under the modified 'coppice' and 'coppice with standards' systems, based on a 20-year rotation; for the tropical evergreen forest the management system adopted was similar to the selection cutting system prescribed for the deciduous teak forest, based on a 30-year felling cycle. However, the working plan system was discontinued when Thailand banned commercial logging in 1989.

In the period 1960–1988, timber harvesting was carried out through timber concessions under the principle of harvesting yield control. More than 500 concessions were issued, covering about half the country; under this system the forests were over-harvested and residual forest stands badly damaged. After disastrous flash floods in 1988 in Nakomsithammarat Province, in which several

villages were completely destroyed, the government banned logging in natural forests and cancelled all concessions. Despite the logging ban, however, the forests remained accessible and forest clearance and encroachment became widespread. In 1995, it was estimated that there were about 10 million people living on state forest lands; these lands were subsequently allotted to the squatters (Nalampoon 2002). In 1996, the government of Thailand also revoked all logging licences in mangrove forests to reduce their destruction. Today, there is no official logging in natural forest; nevertheless, illegal tree-cutting remains a problem<sup>a</sup>, as does encroachment; for example, an estimated 77,000 hectares were encroached upon, presumably by settlers, in the period 1993–98<sup>a</sup>.

**Silviculture and species selection.** Silvicultural management was started in Thailand in the early part of the last century. Different silvicultural systems such as selection, shelterwood, coppice with standards and modified coppice were tried and adopted as appropriate.

The pattern of wood use has changed over the last few decades. During the period of the logging concessions, the five most important species in the timber market were *Dipterocarpus alatus* (29%), *Shorea obtusa* (12%), teak (8%), *Hopea* spp (8%) and *Xylia kerrii* (5%)<sup>a</sup>. Now, plantation species have taken the place of all but teak (Table 2), which is derived from 'semi-natural' forest.

### Planted forest and trees outside the forest.

The RFD began planting teak in 1906 on an area of less than one hectare. By 1980, the annual area planted was about 160,000 hectares, under the *taungya* system. The state enterprises (Forest

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

Total	Natural				Planted		
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	Total	With management plans	Certified
0	n.a.	n.a.	n.a.	n.a.	1,870	250*	1

\* Semi-natural planted teak forests

Industry Organisation and Thai Plywood Factory) also established teak plantations to feed the industry. In 1992, the government passed the Forest Plantation Act, allowing the private sector to establish plantations on degraded forest land. In 1994, the RFD launched a forest plantation promotion project to encourage and support private landowners and local farmers to establish forest plantations of commercial tree species and to help the country become more self-sufficient in timber. Through this project, private owners of plantations were to receive a subsidy from the government. In 2000, the areas of plantation species were: teak – 836,000 hectares; *Eucalyptus* spp – 443,000 hectares; *Acacia mangium* and other *Acacia* spp – 148,000 hectares; other broadleaved species – 541,000 hectares; *Pinus merkusii* and other *Pinus* spp – 689,000 hectares; and other conifers – 148,000 hectares (FAO 2001). But perhaps the most important plantation species for the timber industry is *Hevea brasiliensis* (rubber); the country's large estate of this species, planted originally for its rubber latex, has increasingly been harvested for its timber. Timber from agroforestry plots, home gardens, avenue trees and farm trees is of increasing importance in Thailand.

**Forest certification.** Legal forest production is based on non-forest sources and planted forest; thus there is no natural forest certified in Thailand. As of October 2005, one planted forest of 921 hectares had been certified by the FSC (FSC 2005).

**Estimate of the area of forest sustainably managed for production.** With logging activities banned in the natural-forest PFE, there is no natural forest area sustainably managed for timber production; semi-natural planted teak forests in which timber production is possible are treated as planted forests in Table 3.

**Timber production and trade.** Industrial roundwood production (a large part of it rubberwood) grew from 4.98 million m<sup>3</sup> in 1999 to 7.80 million m<sup>3</sup> in 2003 (ITTO 2004, 2005); total roundwood production, including for fuelwood, was 27.9 million m<sup>3</sup> in 2003 (FAO 2005b). Sawnwood production increased dramatically from 147,000 m<sup>3</sup> in 1999 to 2.29 million m<sup>3</sup> in 2003, and veneer also grew rapidly, from 3,000 to 160,000 m<sup>3</sup>; plywood production increased more sedately over the period, from 82,000 to 90,000 m<sup>3</sup> (ITTO 2004, 2005). Thailand's downstream processing, particularly furniture and joinery, is also thriving.

Thailand is a net importer of primary wood products. Log imports were about 380,000 m<sup>3</sup> in 2003, down from 466,000 in 1999; sawnwood imports were 1.65 million m<sup>3</sup> in 2003 (ITTO 2004, 2005). Thailand also exported about 1.51 million m<sup>3</sup> of rubberwood sawnwood in 2002 (ITTO 2005).

**Non-wood forest products.** Rattan and bamboo are the most important marketed NWFPs, but pine resin, lac and medicinal plants also have considerable commercial value. The RFD maintains some 102 forest recreation sites, attracting an estimated 16 million visitors per year<sup>a</sup>.

### Forest for protection

**Soil and water.** Since 1965, the RFD's Watershed Management Division has taken measures to rehabilitate degraded steep lands in watersheds through tree-planting and the establishment of forest villages. Catchment areas have been divided into five classes based on the level of protection needed; Class I areas are to be put under strict control. The forest area managed primarily for the protection of soil and water is estimated to be about 9.32 million hectares<sup>a</sup>. However, controlling

**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
8,260	5,450	9,320	n.d.	522 <sup>d</sup>

encroachment and other human activities to ensure compliance with existing laws and regulations relating to soil and water conservation is proving almost impossible<sup>a</sup>.

**Biological diversity.** Thailand has at least 1,190 tree species, 9,440 flowering plants, 591 ferns, 292 mammals, 962 birds and 123 amphibians<sup>a</sup>. Thirty-eight mammals, 50 birds, 22 reptiles, three amphibians and 88 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 26 mammals, 40 birds, three amphibians and one plant are found in forests (IUCN 2004). Fifteen plants are listed in CITES Appendix I and 279 in Appendix II (CITES 2005).

**Protective measures in production forests.** As there is no timber production in natural forests, all forests are considered as protection forests, although many are still harvested for NWFPs for local consumption<sup>a</sup>. In mid 2002, the RFD introduced a new ecosystem management plan for the 1.8-million-hectare Western Forestry Complex that prescribes protective measures to sustain forest ecosystems.

**Extent of protected areas.** Thailand has a well-established system of 349 protected areas covering a total area of 8.25 million hectares<sup>a</sup>. According to UNEP-WCMC (2004), 5.45 million hectares of forest are in protected areas that conform to IUCN protected-area categories I-IV, including 2.04 million hectares of semi-evergreen moist broadleaved forest, 1.63 million hectares of deciduous and semi-deciduous broadleaved forest, and 627,000 hectares of lower montane forest. However, Thailand's protected-area system is fragmented (ICEM 2003), and some areas may be too small to sustain their flora and fauna, particularly large mammals.

**Estimate of the area of the forest sustainably managed for protection.** Five-year management plans are being produced for all gazetted national parks and wildlife sanctuaries. By 1999, more than

30 national parks and about 20 wildlife sanctuaries had approved management plans (ICEM 2003). However, clear data on the status of management in a large part of the protection PFE are not available. ITTO is providing support for the management of the Phatam Protected Forests Complex in northeast Thailand and to initiate cooperation in transboundary biodiversity conservation between Thailand, Cambodia and Laos. The project extends over an area of 174,000 hectares covering four protected areas. Another ITTO project supports the development of the buffer zone of the 348,000-hectare Kaeng Krachan National Park using participatory approaches. These areas are thought to be managed sustainably.

### Socioeconomic aspects

**Economic aspects.** The decrease in forest production over the past 20 years has reduced the contribution of forestry to GDP to about 0.1%<sup>a</sup>. However, the wood-processing sector has been increasing production in recent years using timber obtained mostly from plantations, non-forest sources and imports; illegal logging contributes an unknown percentage of the timber supply. Employment figures in the forest sector are not available<sup>a</sup>. Tourism is the country's primary source of foreign exchange, and, no doubt, protected forests are a significant attraction.

**Livelihood values.** An estimated 10 million forest-dwelling and rural communities are dependent on about 2.6 million hectares of forests for subsistence uses and traditional and customary lifestyles<sup>a</sup>, making use of NWFPs such as edible plants, wild fruits, wild meat, mushrooms and honey.

**Social relations.** The enactment of the Community Forest Bill would help community forestry to gain new prominence in Thailand and could help resolve conflicts between the national forestry administration and local communities. However, the long-running debate over the draft bill illustrates its contentious nature.

## Summary

Forestry in Thailand is constrained by several factors. Coincident with Thailand's rapid economic growth in the 1980s and 1990s, its forest resources became severely depleted. Logging in natural forests has been banned, but the forests remain under pressure from encroachment, illegal logging, fire and other agents. The Royal Forest Department, the government agency responsible for forests, has a long history of forest management and remains reasonably well resourced. Plantations, especially of rubberwood, and imports are now supplying the country's thriving downstream-processing timber industry. The huge importance of tourism to the Thai economy provides an excellent incentive for strong measures to improve forest protection.

## Key points

- The PFE is estimated to be 10.1 million hectares, of which 1.87 million is production PFE (all plantations) and 8.26 million protection PFE.
- An estimated 50% of the reported PFE in 1991 has been converted to agriculture, settlements and other uses.
- A logging ban has been in place in natural forests since 1989, after disastrous flash floods; however, it has not been sufficient to stop forest loss and degradation.
- Illegal tree-cutting in natural forests remains a problem.
- At least 522,000 hectares of protection PFE are being managed sustainably, but generally little information is available on the status of management in forested protected areas.
- Forests are owned by the state. There is an ongoing debate in Thailand about the rights of traditional and local communities to use and manage forests, including in protected areas.
- A draft Community Forestry bill has been under development and debate in Thailand for more than a decade.
- Timber production in Thailand has shifted from natural forests to planted forests, particularly teak and rubberwood, and non-forest sources of wood, supplemented by imports.

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