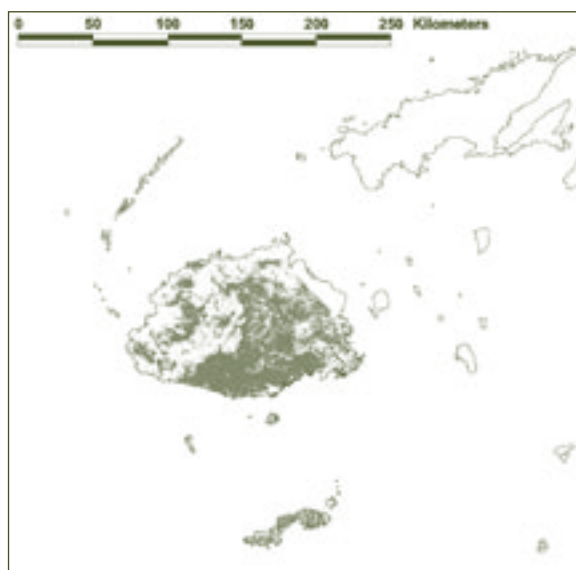


FIJI



*For legend see page 58

Forest resources

Fiji has a population of about 900,000 people. It is located in the South Pacific and comprises more than 300 islands with a total land area of approximately 1.83 million hectares. The two largest islands, Viti Levu (1.02 million hectares) and Vanua Levu (556,000 hectares), make up 86% of the total land area; they are volcanic in origin and mountainous, rising to 1,323 m at Tomaniivi (Mt Victoria). The eastern sides of Viti Levu and Vanua Levu receive an annual rainfall of over 2,500 mm and support tropical rainforest, while the western portions receive less than 1,700 mm annually and support a higher proportion of (mainly secondary) grass and savanna. Estimates of total forest area (including planted forests) include 815,000 hectares (FAO 2005), 853,000 hectares (Jiko 2003) and 930,000 hectares^b.

Forest types. The predominant forest type is tropical moist forest, usually called rainforest in Fiji. Small areas of remnant rainforest occur in the grasslands, which themselves are mainly the result of repeated burning of the drier parts of tropical moist forests, leaving remnants of the original forest type and a fringe of deteriorating shrubland at the interface of the forest and grassland. There is also a significant area (around 42,000 hectares) of mangrove forest.

Dynamics of forest resource change. Most of the remaining natural forest in Fiji is on steep and broken mountainous country and difficult to access. During the 1990s, annual deforestation averaged 2,000 hectares, or 0.2% (FAO 2005), mainly in the drier parts of the two main islands. Forests are subject to periodic wind damage of varying intensity, including cyclonic; the existing forest structure can be partly attributed to this.

Permanent forest estate. There is no formally designated PFE in Fiji, and statistical information on forest area differs according to source and even within the same source. Some 240,650 hectares of natural forest have been described as protection forest (Jiko 2003), mainly on the grounds that these areas are too steep to log with present techniques. A classification into multiple-use natural forests, protection forests, nature and forest reserves, and plantation forest was being considered by the authorities in early 2005. The estimate of PFE contained in Table 1 comprises protection forests (as per Jiko 2003) and planted forests, as these are deemed to be effectively committed to permanent forest use. Another 331,000 hectares of logged natural forests could be considered for inclusion,

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares)			Total
		Production		Protection	
		Natural	Planted		
0.82–0.93	747	0 ^d	113 ^b	241	354

but the degree of 'permanence' of these forests is unclear. Thus, at present there is no natural-forest production PFE in Fiji.

Planted forests. Fiji has a successful plantation program. The large-scale planting of pine and hardwoods by government began in the 1960s and, by now, some 13% of the country's forests are planted. In 2003, there were an estimated 52,900 hectares of hardwood plantations (mainly *Swietenia macrophylla* – mahogany), 46,300 hectares of pine and 14,300 hectares of mixed plantations^{b,d}.

Institutional arrangements

Forest tenure. Communal groups (*mataqali*) own 89% of the unexploited forests and 84% of all Fijian forests, including planted forests; the remaining 16% of forests are privately or state-owned. The Native Land Trust Board (NLTB), which was set up in 1940, deals with local resource management and administers all customary land with the consent of landowning units. The Board is chaired by the Minister for Fijian Affairs and its members are nominated by the Great Council of Chiefs; it also includes one or two government representatives.

SFM policy framework. Fiji's commitment to SFM is demonstrated by its adherence to the Forest Principles of the 1992 Earth Summit and membership of ITTO.

Forest policy and legislation. The forest policy of Fiji was enacted in 1950 by the then Legislative Council. The sawmilling policy, formulated in the 1960s, was amended in 1995 to support the modernization of the industry. The Forest Decree of 1992 updated the Forest Act of 1953. A review of the forest policy has just been completed; its findings will now be the subject of stakeholder consultations with a view to arriving at a more broad-based policy.

The National Forestry Action Plan (NFAP) prepared in 1989 was a classic investment plan. It led to the identification of 29 projects that were presented to donors in May 1990; 25 have been, or are being, implemented. The Strategic Forestry Plan, 2002–2005, which supplements the NFAP, has the following objectives: (i) to provide an appropriate institutional and physical infrastructure to support the development of the forestry sector; (ii) to ensure the sustainable development and management of

forest resources; (iii) to promote community-owned and -managed forest-processing and value-adding facilities based on indigenous forests and community-owned plantations; and (iv) to promote the production and export of value-added timber products.

Institutions involved in forests. There are four governmental/quasi-governmental institutions responsible for or otherwise involved in forest management. These are: the NLTB, for the leasing of native land for forestry purposes; the Forestry Department, for the licensing of timber harvesting, transport and export, policy and planning, and research, training and overall forest management, including extension plantations and timber production statistics; Fiji Pine Limited (FPL), a public company wholly owned by government and landowners which is responsible for pine plantation establishment, management, utilization and marketing; and the Fiji Hardwood Corporation Limited (FHCL), a government-owned subsidiary responsible for the hardwood plantations in the process of becoming a government-landowner company similar to FPL. The potentially high value of the mahogany resource and disputes over ownership and control of the FHCL were contributing factors in a military coup that took place in Fiji in 2000. The Forestry Extension Division of the Forestry Department provides landowners with technical advice and assistance in the implementation of SFM.

Regional and global NGOs play a role in developing, applying and disseminating forest-related information to the community because of their networking strength at the local level. Such organizations include the South Pacific Action Committee for Human Ecology and the Environment (SPACHEE), the Foundation for the Peoples of the South Pacific (FSP), Greenpeace, WWF and the Wainimate Group.

Status of forest management

Forest for production

Logging on native land is allowed only with the consent of both the *mataqali* and the NLTB. Timber-cutting rights are negotiated between concessionaires or licensees and the NLTB, which authorizes the Forestry Department to issue logging licences and to administer concession agreements. Around 0.29 million hectares, which is about 40% of the total natural forest area, has been allocated

Table 2 Some commonly harvested species for industrial roundwood (2002–2004)^b

Timber species	Remarks
<i>Swietenia macrophylla</i> (mahogany)	From planted forests, popular and versatile decorative timber
<i>Pinus caribaea</i> (Caribbean pine)	From planted forests, bulk of it used to make woodchips
<i>Myristica</i> spp (kaudamu)	Natural forest species, used in sawmilling
<i>Endospermum macrophyllum</i> (kauvula)	Construction and joinery timber
<i>Agathis vitiensis</i> (dakua makadre)	Decorative timber, also for veneers and plywood

to concessions and long-term licences^b (see below). Each licence applies to gross areas of land that include a mosaic of production, non-commercial and protection forest^b. Royalties are collected by the Forestry Department and passed on in full to the landowners, except for an administration levy deducted by the NLTB. The Forestry Department also levies fees on the licence-holders for log-scaling, regeneration costs and so on. To further the sustainable management of its forests, the Fiji government has formulated a national code of logging practice to give practical guidance to those involved in logging; this prescribes operational, safety and environmental standards. The code is now being revised to include RIL and other silvicultural practices designed to enhance forest regeneration.

To harvest timber on any land, 'forestry right licences' are required. These are of four kinds: timber concessions (10–30 years), long-term licences (ten years), annual licences and other licences and pre-payment licences (usually for land-clearing). One important government initiative was the development of a natural forest management pilot project to assess the effect of different intensities of logging on the regenerative capacity of the forests. It was aimed at maintaining the composition and structure of the natural forest and stimulating growth and natural regeneration while ensuring the active participation of landowners. The results will now be applied in a much bigger forest area to test the initiative's commercial applicability. The Forest Department organizes training in logging to improve skills and techniques, reduce environmental damage and improve efficiency. However, the forest-sector workforce is currently too small and lacks the necessary skills and support to implement SFM^b.

Silviculture and species selection. Logging in natural forests is based in most cases on a selection system. The normal diameter limit for felling is 35 cm at breast height. Twenty-two species are included in an 'obligatory list' and these must be felled irrespective of market demand. Despite the provisions in the licence agreements, pre- and post-harvest silvicultural prescriptions do not receive proper attention^b. Also often neglected are enrichment and rehabilitation planting in logged-over forests and compensatory afforestation to make up for land transfers. Most of the larger sawmills have their own logging areas and logging operations, but they carry out almost no planting.

More species than the obligatory 22 are used in production and trade. The most readily available and commercially valuable indigenous timbers are retailed directly under their own local names or in mixtures called 'Fiji hardwood' or 'mixed hardwood'. The main commercial species from natural forests are *Agathis vitiensis* (kauri or dakua makadre), *Myristica* spp (kaudamu), *Endospermum macrophyllum* (kauvula), *Calophyllum* spp (damanu), *Palaquium* spp (sacau) and *Intsia bijuga* (vesi). Table 2 shows the main species harvested, including from plantations.

Planted forest and trees outside the forest. The main softwood plantation species is *Pinus caribaea* var. *hondurensis* (Caribbean pine), mostly under the management of FPL and located mainly in the drier zones of Viti Levu and Vanua Levu. There are about 45,000 hectares of this species in plantations; the target is 75,000 hectares. Forestry Department plantings of Caribbean pine began on a small scale around 1950 and, by 1972 (when the expanded 'pine scheme' began), had grown to about 12,000

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
0	n.a.	n.a.	n.a.	113	90	0

hectares. The ownership of what are now the Fiji Pine Trust plantations has had a chequered history. Cyclone damage was almost the only one of the many problems that plagued the scheme that did not originate in disputes over land tenure^b. The main planted hardwood species, mahogany, is managed by FHCL. Mahogany plantations also began in the early 1950s and the expansion of establishment had grown to around 1,000 hectares a year by the mid 1960s. However, the program virtually stopped in 1971 because of widespread attack by the ambrosia stem borer. It resumed after a few years with the development of successful containment measures, and annual planting rates climbed to around 3,000 hectares. By now there are about 53,000 hectares of plantations of this species; the aim is to establish a total estate of about 100,000 hectares^b.

Forest certification. No forest has so far been certified in Fiji, but the 66,981 hectares of forest plantations managed by FHCL are currently undergoing assessment by the Rainforest Alliance SmartWood program for certification under the FSC umbrella.

Estimate of the area of forest sustainably managed for production. No natural forest is contained in the nominal production PFE; moreover, none of the concessions in natural forest are thought to be sustainably managed^b. Of the 113,000 hectares of planted forest in the nominal PFE, about 90,000 hectares are considered intact^b. Most of these forests have management plans, and at least 5,000 hectares, consisting of part of one concession, are being operated under a reasonable degree of sustained-yield management^b.

Timber production and trade. In 2004, there were 26 licensed sawmills, 18 of which were operating (only one of which was large); there were also two small veneer and plywood mills and one woodchip

plant integrated with the large sawmill. Conversion efficiency is thought to be around 50%^b. Industrial roundwood production in 2003 was 380,000 m³, of which 260,000 m³ was softwood from pine plantations (ITTO 2005); this was down somewhat from 470,000 m³ total industrial roundwood production in 1999 (ITTO 2004). In 2003, Fiji produced 84,000 m³ of sawnwood (up from 64,000 m³ in 1999), 8,000 m³ of veneer and 8,000 m³ of plywood, and it exported 9,000 m³ of sawnwood, 2,000 m³ of veneer and 6,000 m³ of plywood (ITTO 2004, 2005). As with most other aspects of forestry, Fiji's wood-processing industries are comparatively more advanced than those in other Pacific Island nations. Despite the increasing role of plantations, two-thirds of processed products (sawnwood and plywood/veneer) are still based on raw material from natural forests. No data are available on the production and trade of mahogany, since harvesting only began in 2003.

In 2001, pine woodchips accounted for 58% of forest products' export earnings, followed by sawnwood and wood-based panels. A small amount of high-quality furniture is also exported, along with small quantities of sandalwood and logs and slabs of *Samanea saman* (rain tree). According to an ITTO diagnostic mission, Fiji is a timber-surplus country and export markets are the key to the sustainability of the forestry sector^b.

Non-wood forest products. NWFPs are of great importance, especially to rural communities. Many plants are used as foods, medicines, construction and roofing materials, artisanal products and dyes, and in ceremonials and rituals. Wildlife, especially pigs, is a valuable source of food. Mud crabs, lobster and shellfish are harvested from the mangrove forests. Stems of tree ferns are collected from forest areas and made into ornamental posts, which are widely used. Some plants, such as *Piper*

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
241	3	18	37	55 ^d

methisticum (yaqona), from which the mild narcotic beverage kava is made, are now largely cultivated, but others are still collected from the wild. A few are marketed, such as *Morinda citrifolia* (nono), which is widely and increasingly used as a medicinal plant with huge potential in international markets, and *Santalum yasi* (sandalwood). Along with tuber crops, *Artocarpus utilissimus* (bread fruit) is a staple food. Another item of ceremonial and niche-market significance is bark-cloth made from the bark of *Broussonetia papyrifera* using natural dyes such as those from *Elaeocarpus pyriformis* and *Aleurites triloba*.

Forest for protection

Soil and water. Land-use practices pay attention to the need for soil and water conservation. Some 241,000 hectares of forest are classified as protection forests, mainly located on steep land with slopes over 30 degrees and with shallow unstable soils.

Biological diversity. There are an estimated 455 species of amphibians, birds, ferns, mammals, palms, reptiles and trees in Fiji (FAO 2001). Five mammals, 14 birds, six reptiles, one amphibian and 66 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, two mammals, eleven birds and one amphibian are found in forests (IUCN 2004). Forty-one plants are listed in CITES Appendix II (CITES 2005). *Santalum yasi* is the most endangered tree species in dry forests, being limited to a small relict population. Little political attention has so far been paid to the protection of forests for their biological diversity, but the rural land-use policy for Fiji now being considered by government may address the issue.

Protective measures in production forests. The prevention of soil erosion has long been a national priority because of the risk of flooding, siltation and damage to coastal ecosystems. Nevertheless,

present forest extraction techniques still damage the soil. Policy and codes of practice are exemplary; implementation is seriously at fault^b.

Extent of protected areas. The total extent of the protection PFE is an estimated 241,000 hectares, although only a fraction of this is formally designated as protected area. According to UNEP-WCMC (2004), about 3,000 hectares of forest are in protected areas that conform to IUCN protected-area categories I-IV, 900 hectares of which are lowland evergreen broadleaved rainforest. Environmental management is integrated into planning and development. The main concerns in conservation areas are the control of encroachment and the maintenance of boundaries. Issues in new conservation sites include conflicts of interest among landowning units and the payment of adequate financial compensation to landowners.

Estimate of the area of forest sustainably managed for protection. The estimated area of protection PFE under SFM is at least 55,000 hectares (Table 4). This comprises 37,000 hectares of legally designated protected areas, all of which have management plans, and 18,000 hectares of mangrove forests that were set aside in 1999 as soil and water protection forest.

Socioeconomic aspects

Economic aspects. Timber is Fiji's third-largest export commodity, accounting for 2.5% of GDP (ADB 2003) and providing employment for about 3,000 people^b. In 2003, the export of sawnwood, plywood and veneer was worth an estimated US\$7 million; significant export income was also earned from woodchips and a small quantity of value-added products (ITTO 2005). The mahogany plantations have enormous value-adding potential. The forest sector is an important generator of government revenue, and the royalties paid to customary owners provide a significant proportion of rural income.

Livelihood values. The culture and livelihoods of traditional landowning communities are closely linked to their forest resources. It is difficult to quantify this value.

Social relations. The system of land tenure in Fiji was introduced in colonial times, based on a local traditional system, and continues to be fraught with difficulty. For example, in developing leasehold arrangements with potential forest developers, a majority of individual members of a *mataqali* must agree to the proposal to the satisfaction of the NLTB^b. The government is promoting community participation in the development of woodlots by landowners; about 100 hectares of woodlots are developed each year. Work in landowner awareness by the Forestry Department is being complemented by an ITTO project on landowner training and education in SFM. There have been tensions over control of the mahogany resource.

Summary

Timber is Fiji's third-largest export commodity and the sector still has considerable growth potential. However, land-use conflicts arising from the pattern of ownership have contributed to the degradation of the forest resource, particularly in natural forest, and have often been viewed as a major constraint to SFM. Other constraints include a lack of convincing evidence for the financial potential of the natural resource (and therefore the continued conversion of forests to various types of non-forest use), an inability to control the standards of logging in natural forests, and inadequate product supply and market research. Fiji's substantial mahogany plantation estate, if well managed and marketed, will be a significant driver of development.

Key points

- Because of the special conditions of land ownership there is no formal PFE, but some forests have equivalent status; an estimated 354,000 hectares may be regarded as a nominal PFE.

- None of the natural production forest (none of which is considered part of the PFE) is considered to be sustainably managed.
- Generally, the standard of logging is low. At least 55,000 hectares of protection PFE are estimated to be managed sustainably.
- Fiji has 55,000 hectares of plantation of the high-value species *Swietenia macrophylla* (mahogany) and there are plans to continue to expand this estate. Harvesting began in 2003; how the mahogany resource is managed and marketed will have a large bearing on the future success of the Fijian timber industry.
- Fiji also has a significant softwood plantation resource, which currently supplies about two-thirds of industrial timber.
- With some additions, Fiji continues to use its forest policy developed in 1950 as the basis of forestry, but implementation is guided by the priority now given to forest development based on exports. A review of the policy was completed recently.
- Apart from the conservation and expansion of forest cover, the forest policy focuses mainly on the efficient processing and manufacture of value-added products and training in forest industries.
- Fiji is a net exporter of wood products, including pine chips, sawnwood and wood-based panels. There is a small export trade of high-value finished products. The expansion of the export of these could make a significant contribution to the economy, particularly when mahogany timber is put on the international market.
- The forest area designated as 'protected' within IUCN categories I-IV is 3,000 hectares, although an area of 241,000 hectares has been broadly described as protection forest.

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