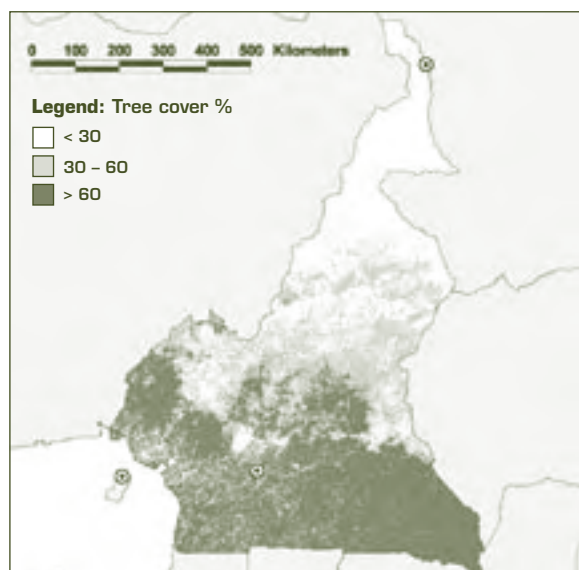


# AFRICA

# CAMEROON



\* Same legend applies to all country maps

## Forest resources

Cameroon has a land area of 47.5 million hectares and a population of 15.7 million people. It stretches between latitudes 2° and 13° north from the Gulf of Guinea to Lake Chad. The coastal plain is about 600 km long and 100–200 km wide, its inland limit marked by slopes and steep scarps. The southern plateau, the site of Cameroon's major closed-forest area, is 500–800 m in altitude and the central Adamaoua high plateau is generally 1,000 m or more above sea level. Mt Cameroon (4,095 m) in the south-west is the highest mountain in western Africa and is still an active volcano. Estimates of forest area include 13.3 million hectares<sup>a</sup> (GFW 2005) and 23.8 million hectares (50% of total land area) (FAO 2005a).

**Forest types.** Cameroon's forests are mainly closed tropical broadleaved rainforests of two predominant types: lowland evergreen and lowland semi-deciduous. The closed evergreen forest that formerly covered

the entire coastal lowland has been largely cleared and, where it still exists, consists of secondary forests and degraded primary forests. Inland, semi-evergreen lowland forest gives way to a mosaic of degraded rainforest and secondary grassland. North of this is Sudanian woodland with *Acacia* wooded grassland.

The closed evergreen forests can be divided into two broad categories: the Biafran forest, forming an arc around the Gulf of Guinea, and the Congolese forest farther inland. The Biafran forest in low-altitude coastal areas is characterized by species like *Lophira alata* (azobé) and *Sacoglottis gabonensis*. There is a long-standing trade in timber from this forest, especially in azobé and *Pycnanthus angolensis* (ilomba). The Congolese forest includes closed evergreen rainforest and semi-deciduous forests. The closed evergreen rainforest differs from the Biafran forest in the absence of species of Caesalpinaceae – with the exception of *Gilbertiodendron dewevrei*; another feature is the importance assumed by *Baillonella toxisperma* (moabi). The medium-altitude closed semi-deciduous forests are marked by an abundance of Sterculiaceae such as *Cola* spp, *Eriobroma oblonga* (eyong), *Mansonia altissima* (bété) and *Triplochiton scleroxylon* (ayous). They are particularly rich in commercial species, including various Meliaceae such as *Entandrophragma cylindricum* (sapelli) and *Entandrophragma utile* (sipo).

**Dynamics of forest resource change.** Annual deforestation in Cameroon in the period 1990–2000 was an estimated 222,000 hectares (FAO 2005a), the main cause being land conversion for small-scale agriculture and agro-industry.

Forest fires occur regularly in the drier northern part of the country. There is some anecdotal evidence of a lengthening of the dry season over the past decade or so<sup>c</sup>.

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		
13.3–23.8	19,985	8,840	17	3,900*	12,757

\* Source: GFW (2005)

**Permanent forest estate.** The forest law of 1994 divides the forest area into permanent and non-permanent forest areas (*domaine forestier permanent et non permanent*). The permanent forest includes the categories forest reserves, protected areas and council forests; non-permanent forest includes communal forest, community forest and private forest. Cameroon has an estimated 12.8 million hectares of natural-forest PFE, comprising 8.84 million hectares of production forest (including council forests, the objectives of which may vary between councils) and 3.90 million hectares of protection forest (Table 1). Article 22 of the 1994 forest law requires that the PFE covers at least 30% of the national territory (*ibid.*).

**Planted forests.** Planted forests cover about 17,000 hectares in Cameroon. Most have been established by the state; no information is available about private planted forests. There are extensive agro-industrial plantations, including an estimated 42,000 hectares of rubber (FAO 2001).

## Institutional arrangements

**Forest tenure.** Most forest land in Cameroon belongs to the state. The permanent forest in the main forest zone in the south is nearly all state-owned under the categories of timber production, protected and protection forests. About 345,000 hectares of closed forests are communal forests. According to the 1994 forest law, forests outside the PFE exist in three ownership categories: community forests, communal forests and private forest. Generally, people living in forest areas fully retain their traditional user rights in their communal areas within both non-permanent and permanent forests. Stakeholder disputes over forest ownership and the demarcation of boundaries are common (GFW 2005).

**SFM policy framework.** Various C&I systems have been prepared for or tested in Cameroon's forests, including ITTO's C&I, the C&I toolkit of the Center for International Forestry Research (CIFOR), and more recently the ATO/ITTO PCI. A national multi-stakeholder working group developed the basis for national C&I that are compatible with FSC standards. However, none of these processes has so far been implemented beyond experimental field-testing and capacity-building. Cameroon participated in the

development of the convergence plan for forest management in the Congo Basin, which was endorsed by a conference of African heads of state in March 1999; this plan aims to increase coordination and cooperation among countries of the Congo Basin in all activities relating to forests.

**Forest policy and legislation.** A new forest policy prepared by a coalition involving the ministry in charge of forests and the World Bank was adopted in 1995 after a five-year process. The main underlying principle is that of ensuring the sustainability and development of the economic, ecological and social functions of the nation's forests through integrated management that leads to the sustained and lasting conservation and utilization of resources and forest ecosystems. The policy has five goals:

- (i) to ensure the protection of forests, safeguard the environment and conserve biological diversity;
- (ii) to improve the integration of forest resources in overall rural development and to increase the participation of rural populations in forest conservation and management in order to raise their living standards;
- (iii) to sustainably develop forest resources with a view to increasing the contribution of forest production to GDP;
- (iv) to ensure forest renewal through regeneration and reforestation; and
- (v) to set up an efficient institutional system involving all concerned parties in the management of the sector.

A new law on forests, wildlife and fisheries (Law 94/01) was approved in 1994 and supporting decrees on wildlife (95/466) and forests (95/531) issued in 1995. In addition, a new environmental law was approved in August 1996 (Law 96/12). Law 94/01 provides a good basis for introducing SFM; in particular, it stresses good forest management practices through the following provisions:

- the replacement of the former forest licence system by a forest concession system;
- the compulsory preparation and implementation of long-term forest management plans in concessions and simple forest management plans (*plan de gestion*) in forests attributed to communes and communities;

- the introduction of provisions in respect to concession allocation; and
- the creation of forest brigades and an inspection panel at national and provincial levels for forest control.

**Institutions involved in forests.** The Ministry of Forests and Fauna (*Ministère des Forêts et de la Faune* – MINFOF), formerly the Ministry of Environment and Forests (MINEF), is primarily responsible for forest policy and the supervision of the legislative framework. Within MINFOF, the Directorate of Forests (*Direction des Forêts*) is responsible for forestry implementation. It contains several major sub-directorates, including the forest management and inventory unit (*Sous-Direction des Inventaires et Aménagements Forestiers*) and the unit for community forests (*Sous-Direction des Forêts Communautaires*). The National Forestry Development Agency (*Office National de Développement des Forêts* – ONADEF) – a parastatal agency – was, until recently, responsible for technical forestry, including inventories, forest management, reforestation, wood promotion and desertification control, but was dissolved in 2003 and replaced by the National Agency for Forestry Development (*Agence Nationale de Développement des Forêts* – ANAFOR). The government employs a total of 282 staff with university degrees in forest-related positions<sup>a</sup>. However, despite considerable efforts to reorganize the forest administration and to improve forest law enforcement, the implementation capacity of MINFOF remains weak due to a lack of funding, training and internal control<sup>c</sup>. More than 100 national and international NGOs, including major conservation NGOs such as IUCN, WWF, Conservation International, The Nature Conservancy and the Wildlife Conservation Society (WCS), are active in Cameroon. Global Forest Watch (GFW), a US-based NGO affiliated with the World Resources Institute (WRI), is working with MINFOF to improve forest statistics.

## Status of forest management

### Forest for production

As provided by Law 94/01, commercial forestry is mainly implemented in the PFE through concessions and timber-licence contracts between the state and private entrepreneurs. FMUs are the basic unit of

timber harvesting; they are limited to a maximum size of 200,000 hectares and allocated by public tender. A forest concession consists of one or several FMUs. The preparation of the management and business plans and arrangements for implementation are the responsibility of the concession-holder under state supervision; to assist this, in 1998 ONADEF produced a guide to the preparation of forest management plans in production forests. Bids can be submitted by national or foreign investors to MINFOF, which awards the FMU on the advice of a technical committee. After paying a security deposit within 45 days of notification, the winning party receives a three-year provisional concession licence. During this period the concessionaire must prepare a fully-fledged forest management plan and make arrangements with all stakeholders involved, in particular any local forest users. The contract for the full concession is valid for 15 years and is renewable. A second type of management arrangement has also been developed (also under Law 94/01) in which communities can obtain forest user rights for 15 years for forest plots of up to 5,000 hectares.

In 2004, nine foreign companies (a few with some local ownership) held 3.15 million hectares of the concession area in 45 FMUs (GFW 2005). Of all 72 FMUs, 32 had approved management plans, the management plans of 17 had been rejected by MINFOF, the status of 14 was unknown and 19 were in process (ibid.). Poor logging practice, illegal logging and encroachment are reportedly common<sup>c</sup>, but no official data on their extent are available<sup>a</sup>.

In addition to the allocation of larger tracts of production forests to industrial investors, communities can manage communal forests for timber and non-timber production based on simplified forest management plans. In March 2001, eleven communal forests had established such plans, and 52 other proposals were being prepared.

There are two other logging permit systems in force, reserved for Cameroonian citizens. The harvesting permit (*permis d'exploitation*) is directly allocated by the minister in charge of forests and is applicable in the non-permanent forest estate; each permit is restricted to 500 m<sup>3</sup> in volume. The *autorisation de récupération*, a type of logging right allocated by the provincial representative of MINFOF, allows the cutting of up to 30 m<sup>3</sup> per permit.

**Table 2 Some commonly harvested species for industrial roundwood<sup>c</sup>**

Timber species	Remarks
<i>Triplochiton scleroxylon</i> (ayous)	Nearly 30% of production (2000–2003)
<i>Entandrophragma cylindricum</i> (sapelli)	Nearly 20% of production
<i>Lophira alata</i> (azobé)	Locally important, more than 10% of production
<i>Terminalia superba</i> (fraké)	About 40,000 m <sup>3</sup> per year, 5% of production
<i>Chlorophora excelsa</i> (iroko)	Nearly 38,000 m <sup>3</sup> per year harvested on average between 2000–2003

**Silviculture and species selection.** A 1998 decree of Law 94/01 stipulates silvicultural standards for forest management. The felling cycle is set at 30 years and minimum harvesting diameters are indicated for each species. The standards further describe the designation of future crop trees, the tending of natural regeneration, thinning, enrichment planting and refinement<sup>c</sup>.

Cameroon has over 600 tree species, of which some 300 are fairly common in the tropical moist forests. Of those, fewer than 30 are currently used in significant quantities for timber and fewer than a dozen species make up the bulk (80%) of the trade. Table 2 lists some commonly harvested species.

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

The first planted forest was established with ayous in 1937. Several thousand hectares of plantations have been established since, but most of them were abandoned before maturity. Plantations were established during the 1950s, with a variety of species such as *Terminalia ivorensis*, *Aucoumea klaineana*, *Tectona grandis*, *Pinus* spp, various Meliaceae and eucalypts. In addition, *Gmelina arborea* was planted to produce matches. Firewood plantations, and plantations to protect soil and farmland and for other purposes, were started about 30 years ago with good results and were promoted on agroforestry land; species used include *Cassia siamea* and *Dalbergia sissoo*.

**Forest certification.** No forest has yet been certified in Cameroon. The government is actively involved in the development of the African Timber Certification Scheme, and some companies – including the Dutch Wijima Douala SARL – have undergone preliminary auditing as part of the FSC certification process.

The Swiss-based auditing firm *Société Générale de Surveillance* (SGS) is responsible for checking exports of timber and ensuring that the government collects the correct level of levies, and has developed a computerized log-tracking system with bar codes for this purpose. Cameroon is also participating in an ITTO project that is helping to build capacity for the implementation of the ATO/ITTO PCI at the national level in the African ITTO member countries. It aims to train at least 60 forestry staff in each country in the implementation of the PCI, develop an auditing framework for African forests, and train at least 60 trainers in the procedures for conducting audits based on the PCI at the FMU level.

**Estimate of the area of forest sustainably managed for production.**

At least 500,000 hectares of natural-forest PFE are estimated to be under SFM. This area comprises the forests allocated to long-term concessions leased out to timber companies which have been present in the area for several years, have approved forest management plans, and are presently engaged in a process of certification.

**Timber production and trade.**

The total roundwood production in 2002 was estimated to be about 10.9 million m<sup>3</sup>, of which 9.33 million m<sup>3</sup> were used as fuelwood (FAO 2005b). Total industrial roundwood production in 2003 was 1.65 million m<sup>3</sup>, down from the 2.65 million m<sup>3</sup> produced in 1999 (ITTO 2004, 2006 in prep.). Sawntwood production in 2003 was an estimated 658,000 m<sup>3</sup> and plywood production in 2003 was about 39,000 m<sup>3</sup>, significantly lower than the 92,000 m<sup>3</sup> produced in 1999 (ibid.). Veneer production in 2003 was 50,000 m<sup>3</sup> (ITTO 2006 in prep.). Cameroon is the seventh-largest exporter of tropical timber and the second-

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

Total	Natural			Planted			
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified	
8,840	4,950*	1,760**	0	500 <sup>d</sup>	17	n.d.	0

\* Source: GFW 2005

\*\* Inc management plan

largest in Africa. The export of logs is banned except for lesser-known species for market promotion and in the first phase of establishment of a new forest concession (up to 30% of the logs may be exported for the first five years after establishment); in 2003, Cameroon exported an estimated 70,000 m<sup>3</sup> of logs (ITTO 2006 in prep.).

**Non-wood forest products.** The bark and fruits of *Garcinia cola* and *G. lucida* (onie and essok) and the nuts of *Gnetum* are used as medicines and stimulants. The nut of *Elaeis guineensis* (Eton palm) is used to make palm wine, *Irvingia* spp (andok or wild mango) and *Ricinodendron heudelotii* (ezezang) as condiments, and *Dacryodes edulis* (plum or assa) as food. The bark of *Prunus africana* is sold to pharmaceutical companies for use in the treatment of prostate gland problems. The powdered bark of *Pygeum africanum* is used worldwide to control urinary disorders in men and as a herbal supplement for benign prostatic hyperplasia. *Baillonella toxisperma* (moabi), a highly priced hardwood member of the Sapotaceae family, is traditionally used by forest-dwellers for the oil from its seeds. Wild meat and other animal products are of major significance in rural and urban areas; the trade in wild meat has been blamed in some forests for declines in the abundance of certain mammals. NWFPs are traded regionally, in particular with Nigeria. Products of *Dacryodes*, *Gnetum*, *Ricinodendron* and *Irvingia* species are frequently found in specialized shops in European cities.

### Forest for protection

**Soil and water.** There are no clear figures on the extent of natural forest and planted forest set aside primarily for water and soil protection.

**Biological diversity.** Cameroon is rich in biodiversity, accommodating more than 8,300 plant species, about 297 mammal species and 848 bird species; nearly half of all the bird and mammal species of Africa are present in Cameroon's forests. Twenty-one mammals, 14 birds, three reptiles, one amphibian and 74 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 30 mammals, 13 birds, 47 amphibians and 249 plants are found in forests (IUCN 2004). In addition, 43 plant species are listed in CITES Appendix II, including *Prunus africana* and *Pericopsis elata* (afroormosia) (CITES 2005).

**Protective measures in production forests.** The forest management prescriptions devised in 1998 include measures to protect soil, biodiversity and the flow of water in concession areas. They also include a series of stand treatments to encourage the regeneration of commercial tree species in natural stands. Provisions specify zones where hunting is permitted or banned and the length and dates of the hunting season depending on location and species.

**Extent of protected areas.** An estimated 3.90 million hectares of forests are in some form of protected area, comprising national parks (2.91 million hectares), wildlife reserves (739,000 hectares), wildlife sanctuaries (24,600 hectares) and zoological gardens (6,700 hectares); a further 867,000 hectares of FMUs have been set aside for conservation purposes (GFW 2005). According to UNEP-WCMC (2004), 2.65 million hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV, of which 2.26 million hectares are lowland evergreen broadleaved rainforest. The first six national parks in Cameroon were set up primarily to attract tourists to Sudanian savanna and woodland vegetation types in the north

**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
3,900	2,650	n.d.	n.d.	n.d.

of the country. The major forest zone in the southern part of the country was, until recently, less well represented in the protected-area system. The Korup area was upgraded from faunal reserve to national park by presidential decree in 1986 and the forest reserves of Dja and Pangar Djerem are also being proposed as national parks.

**Estimate of the area of forest sustainably managed for protection.** Insufficient data were available to estimate the area of protection PFE sustainably managed (Table 4). Threats to protected areas include poaching for the commercial wild-meat trade and encroachment by shifting cultivation. A tri-national treaty (*Convention de la Trinationale de la Sangha*) was signed in early 2000 to allow the sustainable management of three adjacent protected areas in the transboundary zone of Cameroon, CAR and Congo. The Mengame Gorilla Reserve, a transboundary protected area connected to the Minkebe Protected Area, Gabon, is the subject of an ITTO project to strengthen management there, but while it is making good progress it is not yet possible to categorize its management as sustainable.

### Socioeconomic aspects

**Economic aspects.** Timber is Cameroon's second most important export after petroleum; wood-based exports generated revenue of US\$210 million in 2001. According to their licence contracts, forest concession-holders need to link the forest concession with industrial processing units, thus providing stable employment in remote rural communities. An estimated 45,000 people are employed in the forestry sector<sup>a</sup>.

**Livelihood values.** Forests provide many local communities with foods, medicines and locally traded goods. Forests also have a major spiritual value for the various ethnic groups in the country.

**Social relations.** Law 94/01 stipulates public participation in the design and implementation of forest management policies, enlisting all partners,

including governmental agencies, the private sector, communities and people living in and around the PFE. Arrangements are made between concession-holders and local people on a case-by-case basis according to rules established in the forest law. Local people should receive 10% of the forest fees and taxes from commercial forest concessions. From such fees collected, 40% are to be invested into local and district development. Forest concessions situated within the jurisdiction of a community also need to be accessible for NWFP harvesting by local populations.

### Summary

Cameroon possesses significant forest resources with good potential for SFM. The policy environment is sound and governmental responsibility for forests is vested in a single ministry, the Ministry of Forests and Fauna (MINFOF). However, the capacity of the ministry to fully enforce the forest law and implement the forest policy is low. Cameroon is yet to translate many of its ambitious forest management goals into practice and effectively protect its PFE from deforestation and degradation.

### Key points

- Cameroon has an estimated 12.8 million hectares of PFE, comprising 8.84 million hectares of natural production forest, 3.90 million hectares of protection forest and 17,000 hectares of industrial timber plantations.
- At least 500,000 hectares of natural-forest production PFE are estimated to be managed sustainably. Insufficient data were available to estimate the area of protection PFE so managed.
- In 2004, nine foreign companies held 3.15 million hectares of the concession area in 45 FMUs. Of 72 FMUs, 32 had approved management plans, the management plans of 17 had been rejected by MINFOF, the status of 14 was unknown and 19 were in process.

- Of the 4.95 million hectares of PFE under licence or allocated to concessions, about 1.76 million hectares had a management plan or had completed forest inventories for the preparation of a management plan.
- The integrity of the PFE is threatened by encroachment, poaching and poor logging practices, including illegal logging, but no official data on the extent of these are available.
- There is a good framework of policy and legislation but its implementation is limited.
- Despite considerable efforts to reorganize the forest administration and improve forest law enforcement, the implementation capacity of MINFOF remains weak due to a lack of funding, training and internal control.
- Cameroon is rich in biodiversity, accommodating more than 8,300 plant species, about 297 mammal species and 848 bird species; nearly half of all the bird and mammal species of Africa are present in Cameroon's forests.
- Hunting for wild meat, including for commercial sale, is believed to have significantly reduced the abundance of certain mammals in some areas.

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- <sup>c</sup> Information derived from the report of, and discussions with participants at, a training workshop on ITTO criteria and indicators, held 15–18 January 2003, Kribi, Cameroon, attended by 32 people from government, civil society and the private sector.
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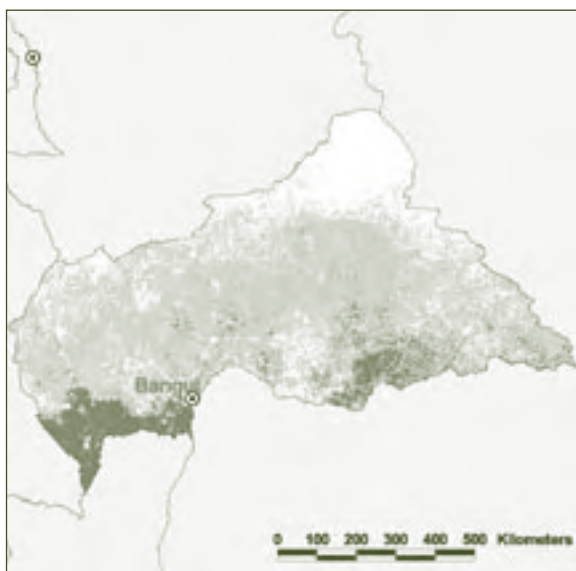
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# CENTRAL AFRICAN REPUBLIC



\*For legend see page 58

## Forest resources

The Central African Republic (CAR) has a land area of 62.3 million hectares and a population of 3.7 million people. Situated in the northern Congo Basin, this landlocked country comprises five biogeographical zones. These are, from south to north: the humid Guinean zone, with annual precipitation between 1,500 and 1,800 mm per year and covered by dense, moist forest; the Sudano-Guinean zone, with annual precipitation between 1,000 and 1,500 mm; the drier Sudano-Guinean zone, containing scattered semi-moist forests and open dry forests and savanna; and the Sahel zone, characterized by dry savanna with annual precipitation of less than 800 mm. The general relief of the country is formed by a peneplain with altitudes varying between 500 and

700 m and two separate basins, the Chad Basin in the north and the Congo Basin in the south. The forest area, including the large expanse of open dry forests and savanna, was estimated to be 22.9 million hectares in 2000 (FAO 2001).

**Forest types.** The major closed forest type is the semi-deciduous rainforest located in the south-western and southeastern parts of the country (*Forêt de Bangassou*). North of the closed forest there is a transition zone between forest and savanna which stretches in an east-west direction. Beyond this, gallery forests border the large rivers. But by far the largest forest area is the open savanna, covering an area of about 17 million hectares<sup>b</sup>. The semi-deciduous rainforests are some of the richest in Africa, containing a high density of high-value timber species such as *Terminalia superba* (limba), *Entandrophragma cylindricum* (sapelli) and *Triplochiton scleroxylon* (ayous), as well as charismatic mammals such as gorillas, forest elephants and bongo. The total standing volume of timber in the southwestern forests was estimated to be more than 127 million<sup>3</sup> in a 1993 survey by the Natural Resource Management Project<sup>b</sup>.

**Dynamics of forest resource change.** The estimated annual deforestation rate in 1990–2000 was about 30,000 hectares per year (FAO 2005a). Bushfires are widespread, particularly in the savanna and in the transition zone from forest to savanna.

**Permanent forest estate.** About 5 million hectares of semi-deciduous closed forests are considered to be productive, including the inventoried forests in the southwest (3.8 million hectares) and the less known, largely unexploited forest of Bangassou in

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>c,d</sup>			
		Production		Protection	Total
		Natural	Planted		
22.9–29.3	4,826	3,500	3	300	3,803

the southeast (1.5 million hectares)<sup>c</sup>. Nearly the whole forest area in the southwest has been allocated, either to forest concessions or as conservation areas<sup>b</sup>. In total, about 2.7 million hectares are classified as harvestable. Over the whole country, 46 classified forests (*forêts classées*), ranging in size from 20 to 120,000 hectares and covering a total area of 633,000 hectares, were set aside between 1948 and 1955 for conservation and production purposes; it is not clear how much of these classified forests are still forested. Table 1 shows the estimated PFE derived by ITTO from various sources; it includes only state-administered closed forest. The estimate of protection PFE includes 250,000 hectares of reserves and parks in the southwest and 50,000 hectares of classified forests; the production PFE is taken here to be the area available for (and currently allocated to) concessions. Outside this PFE, a significant area of degraded primary and secondary forest – as much as 1 million hectares in the southwestern forest area, in particular in the zone of Lobaye – has the potential to be productive under SFM<sup>c</sup>.

**Planted forests.** Planted forests cover an estimated 1,800–3,000 hectares<sup>c</sup>. In addition, the country's one rubber (*Hevea brasiliensis*) plantation covers an estimated 1,000 hectares.

## Institutional arrangements

**Forest tenure.** Most of CAR's forest land is owned by the state, including the state forests that constitute the PFE. There are also community forests, found mainly in savanna areas, which include natural forests and reforestation areas created by communities, and private forests (a small area of reforestation on private land).

**Forest policy and legislation.** The forestry policy adopted in 1989 has three main goals: (i) preservation of the stability of forest ecosystems by management and development, (ii) the rational use of forest resources, and (iii) protection of the forest heritage for future generations. A number of measures have been introduced in an effort to implement this policy:

- a new administrative structure that involves stakeholders, including the rural population, more closely in forest management;
- a new forest code which takes into account the needs of local populations and the principles of SFM in forest concessions;
- a review of forest taxation to simplify it and provide incentives for local processing and the utilization of secondary species;
- the promotion of local processing and a restriction on log exports;
- a cooperative endeavour to conserve and restore forest cover;
- an inventory of closed forests in 1996–1998;
- land-use planning, in consultation with rural populations, for the better allocation of forest lands; and
- improved distribution of forest revenues between the treasury, communities and the Forest and Tourism Development Fund<sup>b</sup>.

In recent years, significant progress has been made in all of these except land-use planning, as no national zoning plan to define the PFE has yet been created<sup>b</sup>. The forest code (Law 90-003), which was promulgated in 1990, was developed with wide inter-ministry and interdisciplinary consultation but little participation by rural populations<sup>c</sup>. The forest code describes, among other things: the different forest types and their legal status, the conservation of forest resources in production forests, and the involvement of local populations in decisions on the granting of forest licences. Forest harvesting remains fully the responsibility of the industrial concession-holders. The country has endorsed the ATO/ITTO PCI and is actively involved in various regional initiatives to promote SFM in the Congo Basin, in particular through the Commission in Charge of Forests in Central Africa (*Commission en Charge des Forêts d'Afrique Centrale* – COMIFAC).

**Institutions involved in forests.** Forestry administration is the responsibility of the Ministry of Environment, Water, Forests, Hunting and Fishing (*Ministère des Eaux, Forêts, Chasses, Pêches, Environnement et du Tourisme* – MEFCPET). MEFCPET is responsible for gathering taxes and fees and for providing funds for programs relating to forests, wildlife and the development of tourism. Other ministries involved in forest development include the Ministry of Commerce and Industry;

**Table 2 Some commonly harvested species for industrial roundwood\***

Timber species	Remarks
<i>Triplochiton scleroxylon</i> (ayous)	21 million m <sup>3</sup> growing stock, 31% of log exports in 2004
<i>Entandrophragma cylindricum</i> (sapelli)	
<i>Aningeria</i> spp (aniegré)	
<i>Entandrophragma utile</i> (sipo)	6% of log exports in 2004
<i>Chlorophora excelsa</i> (iroko)	12% of log exports in 2004

\* Source: MEFCPET 2005

the Ministry of Economic Reform, Planning and International Cooperation; and the Ministry of Finance and Budget.

Staff training and forestry research are undertaken by the University of Bangui and its Agronomic Research Institute. However, both are constrained by a lack of funds and capacity and most professional and technical training is provided on the job by forest companies<sup>b</sup>.

The private-sector Chamber of Agriculture, Animal Breeding, Waters, Forests, Hunting, Fishing and Tourism acts in an advisory role to MEFCPET on issues relating to forest management. A number of local NGOs, such as *Amis de la Nature*, the *Mouvement Femmes-Environnement* and the *Organisation Centrafricaine de Défense de la Nature*, are also active in the forestry sector, although due to a lack of capacity they play only a marginal role in forestry matters.

## Status of forest management

### Forest for production

Large-scale industrial harvesting started in 1968 in the southwestern forests, following an intensive inventory. A second forest inventory carried out in 1991–1993 estimated the standing volume of the 18 most important species at 93 million m<sup>3</sup>; based on a 30-year rotation, the commercial volume harvestable per hectare was estimated at 15–20 m<sup>3</sup>/year<sup>c</sup>.

After a national consultation on forestry in September 2004, harvesting in the PFE is now carried out in large-scale concessions using only one kind of permit called a PEA (*permis d'exploitation*

*et d'aménagement*); the system of special cutting area permits (*permis spécial de coupe*) that co-existed with PEAs was abandoned. Small-scale logging outside the PFE is still permitted under artisanal permits (*permis artisanal*). PEAs are valid for the lifetime of the company. Once a PEA is awarded, the concessionaire must prepare a forest management plan within three years, during which time the concessionaire may start harvesting according to specific prescriptions of the Ministry. In mid 2005, ten timber companies, all foreign-owned, were operational in the southwest over an area of 3.3 million hectares (MEFCPET 2005); the size of forest concessions varied between 200,000 and 562,000 hectares<sup>c</sup>. The PEA stipulates that local people living in or adjacent to the concession must be involved in the process of establishing permits<sup>b</sup>.

There is little awareness in the private sector of the need for SFM. Moreover, the forestry administration lacks the capacity to oversee management of the PFE and to enforce the law, including by imposing sanctions when rules and regulations are infringed<sup>b</sup>.

Forest harvesting is taxed in various ways. There is a general company tax and a value-added tax, in addition to three specific forestry taxes: an annual, area-based forest fee (in 2005 this was US\$1 per hectare<sup>c</sup>); a felling tax of 7% of the taxable value of the felled volume of timber; and a replanting tax paid at the rate of 11% of the taxable value, which is determined by the Finance Law in relation to FOB value at the seaport of Douala, Cameroon. There is also an export tax of 10.5% on roundwood and 4.05% on sawnwood. In late 2004, an environmental tax was introduced for those companies that do not start the preparation of forest management plans as required under the PEAs; this doubles the

**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	
3,500	2,920	650 <sup>c,*</sup>	0	186 <sup>c,d</sup>	3	n.d.	0

\* Concessions covering a further 1.5 million hectares are in the process of developing forest management plans

area-based tax to US\$2 per hectare<sup>c</sup>. A study was carried out in 2004 on ways to replace the area-based fee by a rental fee which takes into consideration the timber value of the forest covered by the permit, but no decision has been taken yet on this matter.

**Silviculture and species selection.** The 1990 forest code makes specific reference to silvicultural management criteria, including: quantitative limits on logging to avoid creaming and favour natural regeneration; the determination of minimum diameters for felling (80 cm for redwood species in the Congo Basin and 60 cm for whitewood species such as ayous<sup>c</sup>); the protection of young trees during logging operations; and the involvement of both rural populations and foresters in conservation and the management of tree-planting. As PEAs are of unlimited duration, long-term management and harvest planning should be possible.

There are about 300 potential timber species in the closed forest area, 79 of which are considered marketable today. Around 30 timber species were harvested in 2004<sup>c</sup>; however, loggers tend to focus on 15–18 high-value species. Table 2 lists five species that made up 90% of production in 2004 (MEFCPET 2005). This selective logging is a possible constraint on SFM because the high-value species will almost certainly become rarer, changing forest dynamics and, in the long term, reducing the financial viability of SFM<sup>b</sup>.

**Planted forest and trees outside the forest.** Most of CAR's planted forests are not maintained and are regularly affected by forest fire<sup>c</sup>. Plantations of fast-growing limba, *Terminalia ivorensis* (fraké), *Cedrela odorata* and *Cordia alliodora* have generally been abandoned. Various tropical hardwoods, including *Tectona grandis* and *Gmelina arborea*, have performed quite well in experimental trials,

but these have not been scaled up. Small community-based firewood plantations of eucalypts, *Acacia mangium* and *Cassia siamea* are important in non-forested areas. In drier areas, trees planted outside forests are of some importance, including neem, *Butyrospermum parkii* (karité), *Anacardium excelsum* and *Acacia albida*.

**Forest certification.** Some timber companies are involved in International Technical Tropical Timber Association (*Association Technique Internationale des Bois Tropicaux* – ATIBT) and ATO initiatives on the certification of African timber (see below). One forest concession, *Industrie Forestière de Batalimo* (IFB), which is 186,000 hectares in size, is in an advanced process of certification under the Keurhout system<sup>c</sup>.

**Estimate of the area of forest sustainably managed for production.** In mid 2005, two companies (IFB and SESAM) with concessions totalling about 650,000 hectares were working under comprehensive forest management plans, and five more covering 1.5 million hectares had made good progress in developing such plans<sup>c</sup>. The IFB concession (186,000 hectares) is pursuing certification and is thought to be sustainably managed<sup>c</sup>.

**Timber production and trade.** Total roundwood production in 2003 was an estimated 2.82 million m<sup>3</sup>, of which at least 2 million m<sup>3</sup> was fuelwood (FAO 2005b). CAR produces relatively small volumes of mostly high-value timbers. In 2003, total industrial roundwood production amounted to an estimated 516,000 m<sup>3</sup>, down from 553,000 m<sup>3</sup> in 1999 (ITTO 2004, 2005). At least 60% of log production must be processed locally into sawnwood, plywood or other value-added products. Some 223,000 m<sup>3</sup> of logs and about 58,000 m<sup>3</sup> of sawnwood were exported in 2003 (ITTO 2005). CAR's exports face numerous constraints: train transport through

**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
300	3,090	5.7	n.d.	n.d.

neighbouring Congo is slow and highly insecure and costs are very high through Cameroon to the port of Douala.

**Non-wood forest products.** Wild meat and other animal products are important NWFPs in CAR's forests. Many foodstuffs, medicinal plants and condiments – including *Piper guineense* (forest pepper), *Xylopia aethiopica* and *Afromomum* spp – are collected in closed and savanna forests and sold locally or exported. No quantitative data were available for this report.

### Forest for protection

**Soil and water.** A number of small areas totalling about 5,700 hectares have been set aside for catchment protection purposes (*mise en défens*).

**Biological diversity.** CAR contains more than 3,600 plant species, 209 mammals and 668 birds. Twelve mammals, three birds, one reptile and 15 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, nine mammals and eight plants are found in forests (IUCN 2004). One plant species is listed in CITES Appendix I and seven in Appendix II (CITES 2005). Several other mammals are locally threatened; the population of elephants, for example, has reportedly decreased to a critical level<sup>c</sup>.

**Extent of protected areas.** The first forest conservation areas to protect the now locally extinct white rhinoceros were created in 1925 (*Réserve de Zimongo*, and the parks of Baminigui, Bangoran and Manovo-Gonda-Saint Floris); these covered more than 1 million hectares of open savanna. Today, protected areas have been greatly extended and cover almost 6.76 million hectares (about 11% of the national territory); they comprise mainly savanna and dry shrub land<sup>c</sup>. The main part of the protected area estate is found in the drier northeast; only about 300,000 hectares are closed forest<sup>b</sup>. According to UNEP-WCMC (2004), 3.09 million hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV,

including 112,000 hectares of lowland evergreen broadleaved rainforest and 2.01 million hectares of deciduous/semi-deciduous broadleaved forest.

**Estimate of the area of forest sustainably managed for protection.** Few data are available on the status of forest management in CAR's protection PFE. Considerable efforts have been made to protect the 120,000-hectare Dzanga-N'doki National Park, which is CAR's part of a tri-national protected area between CAR, Congo and Cameroon; however, insufficient information was available to determine the current status of management there.

### Socioeconomic aspects

**Economic aspects.** Forest taxes account for about 14% of state revenues and its contribution to GNP rose from 2.6% in 1997 to 5.3% in 2001 (MEFCPET 2005). Tax incomes from forests represent 14% of total tax revenues (ibid.). The forest sector is important for employment and in socioeconomic development; about 4,000 people are directly employed in the formal forestry sector<sup>b</sup>.

Rents and felling taxes on forest harvesting are required to be distributed among the beneficiaries as follows: 30% to the Treasury, 40% to the Forest and Tourism Development Fund, and 30% to communities. Of the revenue generated by the replanting tax, 25% goes to communities and 75% to the Forest and Tourism Development Fund.

**Livelihood values.** Wild meat and the gathering of edible fruits, nuts, insects and roots are of great importance for local communities dependent on the forest, in particular Pygmies in the closed forest. Yams (*Dioscorea* spp) are a staple food of the Pygmies.

**Social relations.** The 1990 forest code stipulates the involvement of local people in forest management. According to the law, local people are to have a say in the allocation of concessions and logging permits, and a significant share of revenues generated by forest taxes is to be redistributed to local communities. However, such revenues are unevenly distributed between and within forest communities<sup>b</sup>.

## Summary

CAR possesses a substantial forest resource base in the south with a sizeable growing stock of high-value hardwood timber. Forest production provides important export revenues and contributes 5% or more to GDP. Two forest inventories have been carried out, the results of which can support forest management planning and economic analysis. In 1990, the country introduced a forest code that sets out social, environmental and silvicultural norms. However, there is a gap between the law and its implementation in the field.

## Key points

- CAR has an estimated 3.80 million hectares of PFE, comprising 3.50 million hectares of natural production forest, 300,000 hectares of protection forest and 3,000 hectares of industrial timber plantations.
  - At least 186,000 hectares (about 5%) of the natural-forest production PFE are under SFM. Insufficient data were available to estimate the area of protection PFE so managed.
  - Commercial harvesting is carried out mostly by private entrepreneurs under management permits (*Permis d'exploitation et d'aménagement*), which are valid for the lifetime of the company.
  - In mid 2005, ten timber companies, all foreign-owned, were operating in the southwest of the country in an area of 3.3 million hectares.
  - A relatively small area of closed forest is contained in protected areas.
  - There is little awareness in the private sector of the need for sustainable management, although such awareness may be growing as companies are obliged to develop forest management plans.
  - The ministry in charge of forests, MEFCPET, generally lacks the capacity to oversee management of the PFE and to enforce the law, including sanctions when rules and regulations are infringed.
  - The forest sector generates about 14% of state revenues.
- Wild meat and the gathering of edible fruits, nuts, insects and roots are of great importance for local communities.
  - According to the forest law, a significant share of revenues generated by forest taxes is to be redistributed to local communities. However, such revenues are unevenly distributed between and within such communities.
  - CAR is a landlocked country and the transport costs of exported timber are relatively high compared to those of other countries in the Congo Basin, limiting the profitability of SFM.

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# DEMOCRATIC REPUBLIC OF CONGO



\* For legend see page 58

**Forest types.** Moist evergreen and semi-deciduous forests occupy much of the central and western regions, with moist evergreen forests accounting for about a third of the country's forests (35–40 million hectares). Submontane and montane closed forests include montane rainforests with conifers, montane sclerophyllous forests between 1,500 and 3,200 m, and submontane sclerophyllous forests of *Grewia* spp, *Carissa edulis* and *Euphorbia* spp. Swamp forests are extensive in DRC, covering about 20 million hectares, primarily in the central basin.

**Dynamics of forest resource change.** Forests were lost at an estimated annual rate of 532,000 hectares (0.4%) in the period 1990–2000 (FAO 2005). Uncontrolled forest fires occur regularly at the end of the drier seasons and cause local damage to forest stands that have already been opened up, especially in the less-forested areas.

**Permanent forest estate.** There is so far no formal land-use planning in DRC, but pilot zoning is being applied in the *Province de l'Equateur* over an area of 1.8 million hectares<sup>a</sup>. The state forest area (*domaine forestier de l'Etat*) comprises three forest-use types: classified forests, protected forests and permanent production forests. The government plans to establish a forest survey that would formally recognize the PFE<sup>a</sup>. The closed forest area suitable for industrial harvesting has been variously estimated at about 81 million hectares<sup>a</sup> and 60 million hectares (Sebastien & N'Yanga-Nzo 2001). Table 1 shows a possible eventual PFE based on an ITTO estimate.

## Forest resources

The Democratic Republic of Congo (DRC) has a land area of 234 million hectares and a population of 57 million people. It lies entirely within the Congo Basin, with only 42 km of coastline on the Atlantic Ocean. The north comprises plateaux of 600–800 m in height and, in the south, of 1,000–2,000 m in height. The highest peaks reach 4,500 m in the Virunga volcanic massif on the border with Rwanda and exceed 5,000 m in the Ruwenzori Mountains on the border with Uganda. Some 77% of the country is at an altitude of over 1,000 m. Estimates of total forest cover range from 128 million hectares<sup>a</sup> to 135 million hectares (FAO 2005).

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>d, *</sup>			
		Production		Protection	Total
		Natural	Planted		
128–135	126,236	20,500	55	27,000	47,555

\* The country is in a transitional period in respect to land-use planning. The figures given here are indicative only



**Planted forests.** Planted forests have been established to produce both timber and fuelwood and to protect land from erosion, but the total area is unknown. FAO (2001) estimated the total plantation estate at 96,700 hectares, but this most likely included agro-industrial plantations, particularly of oil palm and rubber; the government of DRC estimated an area of 55,500 hectares<sup>a</sup>.

## **Institutional arrangements**

**Forest tenure.** According to Law 73/021 of 1973, the state is the sole owner of the land and this is confirmed by the new forest code of 2002 (see below). According to this, the local population must be consulted before any area is classified in the planned PFE. Communities or municipalities have customary rights over the forests within their jurisdiction and are able to become long-term concession-holders of such forests. The state can also allocate forests to local communities as community forests.

**SFM policy framework.** DRC has adopted the ATO/ITTO PCI for natural tropical forests in Africa as an instrument for monitoring progress towards SFM.

**Forest policy and legislation.** Forest management was formerly implemented under the colonial Forest Law of 1949 and applied through the *Guide to Forest Exploitation*, which came into force in 1975. A new and comprehensive forest code (Law 11/2002) promulgated in 2002 describes the institutions and responsibilities in regard to forest management and lays down prescriptions for national forest planning and forest management; for example, it devotes an entire chapter to forest management (Title V, Chapter II, articles 71–76) and another to local community rights (Title VIII, Chapter III, articles 111–113). A number of ministerial decrees to implement the code were promulgated in March 2003; these deal with methods for the preparation of forest management plans (*Arrêté ministériel* (AM) 46/03), law enforcement (AM 45/03), reforestation (AM 49/03), forest survey (AM 43/03) and protected forest species (AM 42/03). A number of other decrees dealing with, for example, concession management, community forests, the creation of the PFE and the establishment of a

national forest inventory, still need to be finalized and approved by government. Other relevant new laws are Law 007/03 on mining and Law 015/2002 on labour relations.

**Institutions involved in forests.** DRC has been devastated by about ten years of civil war, which ended officially in late 2002. This left the country with severely damaged infrastructure, an impoverished population and weak or non-existing institutions. The ministry in charge of forests is the Ministry of the Environment, Nature Conservation, Water Resources and Forests (*Ministère de l'Environnement, Conservation de la Nature, Eaux et Forêts*). Within this, the Directorate of Forest Management (*Direction de la Gestion Forestière – DGF*) is responsible for monitoring forest management and harvesting, the Directorate for Water Resources (*Direction des Ressources en Eau – DRE*) for the management of water-related ecosystems, and the Directorate of Fauna and Hunting (*Direction de la Faune et Chasse – DFC*) for game and hunting. A number of governmental services are in place, including: the Permanent Service for Inventories and Forest Management Planning (*Service Permanent d'Inventaire et d'Aménagement Forestiers – SPIAF*); the Congolese Institute for the Conservation of Nature (*Institut Congolais pour la Conservation de la Nature – ICCN*), responsible for the management of protected areas; and the National Reforestation Service (*Service National de Reboisement – SNR*). The lack of trained and motivated staff to manage and control the forests is a crucial bottleneck in building up an effective institutional framework for SFM<sup>a</sup>.

In the present reorganization of state institutions it is intended that the different provinces and districts will be given greater political and economic autonomy. The new forest code includes the concept of community forests, but as yet there are no procedures to put this into effect.

In the 1980s, there were fewer than 100 registered NGOs dealing with natural resource management. Today, more than 1,000 NGOs and associations are involved in forest-related activities. Some multi-national NGOs, including Conservation International, WCS and WWF, have recently engaged in forest conservation in DRC.

## Status of forest management

### Forest for production

The forests near the coast, being relatively accessible, have been logged heavily since colonial times; more recent harvesting has moved into the central basin, where subsistence agriculture is now also affecting some of the swamp forests. Farther inland, outside concession areas, forest harvesting mainly consists of the removal of trees of the most profitable species. The existing legal framework on forest management laid out in Law 11/2002 has not been implemented effectively so far<sup>a</sup>.

Inventories have been carried out over about 21 million hectares, and 16.5 million hectares were mapped before 1992 (ITTO 2003). About 20 million hectares had been allocated to commercial forest operations by mid 2003, but according to DRC forestry officials (pers. comm., June 2005) this area may soon be extended to 50 million hectares. No large-scale concessionaire has been in operation since the end of the war, most of the logging being done on a small scale by forest users who have felling permits but no management obligations (eg for inventory or silviculture). Several interested parties – including mining operators and the military – have been logging without official harvesting contracts. Some large logging companies – mostly foreign-owned – that were active in the past still have legally valid forest concession rights; some of these are interested in re-engaging in the country in the near future should the political situation prove stable. In addition, new foreign-based companies are also prospecting for large-scale forest concessions. According to Law 11/2002, concessions can be allocated for 25 years and are renewable. The maximum area of a forest concession is 500,000 hectares. There are several steps to obtaining forest harvesting rights:

- an authorization for 'forest prospecting' (*autorisation de prospection forestière*) must be obtained to conduct a forest inventory in a given area. This is valid for one year and no harvesting is permitted;
- a letter of intention (*lettre d'intention*) must be secured. This is valid for three years, during which time the concessionaire must invest a minimum of 50% of his planned investment,

particularly in setting up a wood-processing unit. In this period, a concessionaire can, under certain circumstances, begin to harvest timber;

- a supply guarantee (*garantie d'approvisionnement*) must be obtained. This is valid for 25 years and is renewable. It establishes the forest concession and authorizes timber harvesting; and
- cutting permits (*permis de coupe*) are required. These determine the yearly cutting area, limited to 1,000 hectares; a concessionaire may have several cutting permits, depending on the size of the concession. The cutting permit includes a detailed harvesting map and contains information on the timber stand, any protection measures that apply and the social conditions in the area.

In practice, none of these steps are administered in a transparent way. Moreover, the forest service is unable to effectively control illegal logging and other irregular forestry activities (DRC forestry officials, pers. comm., June 2005). Only one zone (Bolobo-Mushie) has a regional forest management plan; this dates from 1986 and covers 1 million hectares (Sebastien & N'Yanga-Nzo 2001).

As of August 2003, two authorizations (347,000 hectares), 27 letters of intent over an area of more than 4.7 million hectares and 112 supply guarantees (granted concessions) over an area of more than 15.5 million hectares were approved, but a further 45 supply guarantees over 9.1 million hectares had not become operative. Even though the number of licences is high, forest harvesting activities are very much less than what would be possible under SFM (see below). Nearly all of the exported timber comes from only six companies, out of which one is producing half. None of the concessions has a management plan (DRC forestry officials, pers. comm., June 2005).

**Silviculture and species selection.** The only silvicultural prescriptions contained in Law 11/2002 are the determination of a minimum harvesting diameter by species and some specific requirements for certain timber species.

The country has an enormous diversity of tree species. The total number of commercial tree species is more than 200, of which about 25 are sold internationally. Some important commercial timbers are shown in Table 2; others include *Gambeya africana* (longhi), *Guarea cedrata* (bossé), *Guibourtia*

**Table 2 Some commonly harvested species for industrial roundwood<sup>a</sup>**

Timber species	Remarks
<i>Gossweilerodendron balsamiferum</i> (tola)	16% of the export value in 2002
<i>Millettia laurentii</i> (wengé)	45% of the export value, mainly from Bandundu region
<i>Chlorophora excelsa</i> (kambala/iroko)	11% of the export value
<i>Entandrophragma cylindricum</i> (sapelli)	6% of the export value
<i>Terminalia superba</i> (limba)	3% of the export value

spp (benge), *Lovoa trichilioides* (dibetou), *Entandrophragma angolense* (tiama), *Entandrophragma utile* (sipo or lifaki), *Entandrophragma candollei* (kosipo), *Pericopsis elata* (afromosia) and *Nauclea diderrichii* (bilinga).

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

*Terminalia superba* (limba) is the main species used in plantations, the first of which were established in 1905. Agroforestry plantations (*taungya*) were introduced in the 1940s and are still widespread. Other species planted for industrial production before the 1960s included *Ceiba pentandra*, *Bombax flammeum*, *Entandrophragma* spp, *Lovoa trichilioides*, *Eucalyptus* spp, *Grevillea robusta*, *Casuarina equisetifolia* and *Cupressus* spp. Species of *Eucalyptus*, *Acacia*, *Pinus* and *Gmelina arborea* have been used for fuelwood and soil protection.

**Forest certification.** So far no forests have been certified in DRC, but some foreign companies are undertaking some baseline studies for certification. DRC participates in the ATO working group on an African certification scheme.

**Estimate of the area of forest sustainably managed for production.** In 2003, no area of production PFE was known to be managed sustainably. However, three forest sites dedicated to forest research and education totalling 284,000 hectares are thought to be so managed (Table 3).

**Timber production and trade.** It is estimated that the closed forest area could sustainably produce about 35 million m<sup>3</sup> per year of industrial wood (Sebastien & N'Yanga-Nzo 2001), but the actual production is far from reaching this figure. Total official production of all roundwood was an estimated 77.2 million m<sup>3</sup> in 2003, but industrial roundwood was only 90,000 m<sup>3</sup> in 2003, down from 170,000 m<sup>3</sup>

in 1999 (ITTO 2004, 2005); however, illegal timber production is likely to have been much higher than that. The country exported an estimated 58,000 m<sup>3</sup> of logs in 2003 (ITTO 2005). Timber-processing capacity has been greatly reduced and needs to be rebuilt.

**Non-wood forest products.** The NWFPs derived from the closed forests are very important all over DRC but particularly in those regions where the prevailing economic hardship is exacerbated by armed conflict. For many people, forests are likely to be the main source of food, medicine and stimulants like cola and palm wine. Wild meat has become scarce in regions where there is armed conflict, thus contributing to malnutrition and famine. No information on the trade of NWFPs was available for this report.

**Forest for protection**

**Soil and water.** No specific measures to promote soil and water conservation in areas of closed forest are in place, although Law 11/2002 cites the need to protect, among others, springs and streams and to conserve soils. Soil and water conservation is regulated by a 1958 decree. Some small plantations have been established for erosion control in the last 30 years.

**Biological diversity.** Of the 11,000 known species of plant in DRC, about 3,200 are considered endemic. Forest inventories suggest that tree species number more than 700, and there are an estimated 415 mammal species and 1,086 bird species. Thirty-two mammals, 30 birds, three reptiles, 13 amphibians and 66 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 23 mammals, 21

**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	
20,500	15,500*	1,080 <sup>c, **</sup>	0	284 <sup>d</sup>	55	40 <sup>d</sup>	0

\* Includes concessions with valid permits (*garanties d'approvisionnement*); not all of them were operational at the time of writing

\*\* Regional forest management plan, Bologo-Mushie

birds, 13 amphibians and 15 plants are found in forests (IUCN 2004). Although the country is large, there is enormous pressure on wildlife through poaching. Wild meat is in demand in rural and urban markets. The elephant population in the forest zone (about 300,000 before 1980) had been reduced to less than 50,000 in 2000 (Sebastien & N'Yanga-Nzo 2001). DRC has listed eight plant species in CITES Appendix I and 53 in Appendix II (CITES 2005).

#### Protective measures in production forests.

Article 48 of Law 11/2002 prohibits logging along streams and within 50 m of riverbanks and 100 m of springs. Poaching is thought to be widespread (DRC forestry officials, pers. comm., June 2005).

**Extent of protected areas.** In general, the major ecosystems remain relatively intact. In 1999, the government approved a strategy and a plan of action for the sustainable use of biodiversity. The country has ten national parks, four of which are listed as UNESCO World Heritage sites, totalling about 9.3 million hectares of forest. In addition, there are three biosphere reserves totalling 300,000 hectares and 21 maintained hunting reserves covering more than 10 million hectares. According to UNEP-WCMC (2004), 9.32 million hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV, including 5.84 million hectares of lowland evergreen broad-leaved rainforest and 861,000 hectares of upper montane forest.

**Estimate of the area of forest sustainably managed for protection.** Protected areas are generally without effective control. Encroachment is widespread and trophy hunting, wild-meat hunting and timber theft are widespread (Sebastien & N'Yanga-Nzo 2001). However, large areas of

DRC's forests are currently under no threat from deforestation or other significant human-induced disturbance due to their remoteness from major human settlements.

#### Socioeconomic aspects

**Economic aspects.** There is no recent information about the contribution of the forest sector to GDP or employment. The forest sector could become a pillar of economic development in DRC in a stable political and macroeconomic environment. There is an important informal sector dealing with wood extraction and wood-processing that generally meets local needs for timber, fuelwood and charcoal.

**Livelihood values.** Natural forests play an important role in the livelihoods of many people, in particular as an important source of food. An estimated 12 million people gain much of their living from forest resources<sup>a</sup>.

**Social relations.** Law 11/2002 (Title VII, Chapter III, articles 111–113) requires that the local population be consulted before any area is awarded to a concession or given protected status. However, it does not address local rights governing the use of forest resources, although it does allow communities to manage a forest concession within their traditionally recognized ancestral lands. There is widespread frustration among rural communities because forest concessions generally only benefit local leaders, who often do not share the benefits with the wider population (Sebastien & N'Yanga-Nzo 2001). In remote areas in particular, forest concessions are sometimes the only providers of primary education and health care, and forest roads have improved access to many remote villages.

**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
27,000	9,320	n.d.	n.d.	0

## Summary

The civil war took a heavy toll on DRC's infrastructure and development. Despite vast forest resources, the forestry sector failed to attract international investors or donors and remains undeveloped. There has been some improvement since 2002 (when the war ended) and the government has developed a policy aimed at encouraging the sustainable use of forest resources. The arrangements for forest and concession management and the enforcement of rules are currently in a state of flux; capacity for SFM remains minimal and its widespread adoption seems a long way off. Nevertheless, the forest sector has the potential (with appropriate planning and regulation) to play a crucial role in the country's recovery and subsequent development.

## Key points

- DRC has vast closed tropical forests and a relatively low level of conversion to other uses, but the forest sector is in disarray as the country emerges from a long civil war.
- DRC has an estimated 47.6 million hectares of PFE, comprising 20.5 million hectares of production forest, 27.0 million hectares of protection forest and 55,000 hectares of industrial timber plantations.
- At least 284,000 hectares of the natural-forest production PFE are being managed sustainably, comprising three research and education forests. No areas of protection PFE are deemed to be so managed.
- Although not under formal management, large areas of DRC's forests are currently under no threat from deforestation or other significant human-induced disturbance due to their remoteness.
- Only one area of production forest, of about 1.1 million hectares, is covered by a management plan.

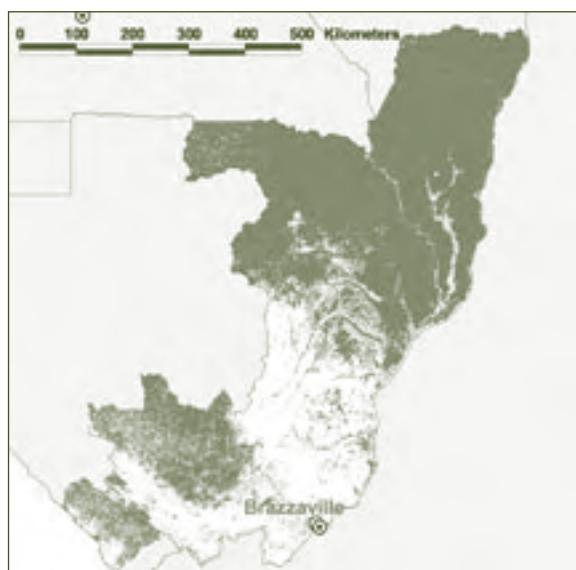
- Under the 2002 forest law, concessions of up to 500,000 hectares can be allocated for 25-year periods (renewable).
- Forestry administration is the responsibility of three directorates within the Ministry of Environment, Nature Conservation, Water Resources and Forests. A severe lack of capacity hinders efforts to supervise the forestry sector.
- The volume of timber harvested in DRC is only a tiny fraction of the potential sustainable yield, even accounting for likely significant levels of illegal logging.
- Four of the country's ten national parks are listed as UNESCO World Heritage sites; an estimated 9.32 million hectares of forest are contained in protected areas conforming to IUCN categories I-IV.

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# REPUBLIC OF CONGO



\*For legend see page 58

## Forest resources

Congo has a land area of 34.2 million hectares and a population of 3.7 million people. Stretching from 3° north to 5° south, it can be divided into three broad biogeographical zones: the southern zone, which covers the forested Mayombe and Chaillu mountains and extensive grassland and savanna; the central zone, which consists of the Bateke Plateau highlands, wholly covered by grass or shrub savanna apart from gallery forests and scattered forest islands; and the northern zone, located mostly north of the equator, which consists of three subregions: the Cuvette, Likouala and Sangha, all mostly covered by intact closed forests. About half of the population lives in the two major cities in the south (Brazzaville and Pointe-Noire), whereas the rural population is concentrated in the southern and central parts of the country. The main forest zone, in northern Congo, is sparsely populated.

Estimates of total forest cover include 20.3 million hectares<sup>a</sup> and 22.1 million hectares (FAO 2005).

**Forest types.** The Mayombe forest, originally rich in *Aucoumea klaineana* (okoumé), has been heavily cleared due to the high population density along the road between Brazzaville and Pointe-Noire and repeated logging. It covers less than 1 million hectares, including extensive secondary forests<sup>c</sup>. The Chaillu forest area, covering 3.4 million hectares, is rich in okoumé, *Terminalia superba* (limba), *Pycnanthus angolensis* (ilomba) and *Entandrophragma utile* (sipo); it has been locally over-harvested and is increasingly encroached upon by farmers. Together, these two forest areas form the southern sector. The northern forests contain redwoods, especially sipo, *Entandrophragma cylindricum* (sapelli), and *Millettia laurentii* (wengé), as well as light hardwoods (eg *Triplochiton scleroxylon* – ayous); they cover 16.5 million hectares, about 40% of which is situated on soils that are flooded for a large part of the year.

**Dynamics of forest resource change.** The deforestation rate between 1990 and 2000 was about 17,000 hectares per year, or 0.1% of the total forest area (FAO 2005). For a long time, the northern forests remained almost untouched because of a lack of infrastructure and low population density. Over the past ten years, however, logging has started in these forests and there is now more in-migration from southern Congo and neighbouring countries. Uncontrolled forest fires occur regularly in the south at the end of the dry seasons.

**Permanent forest estate.** Virtually all the closed natural forest is contained within Congo's PFE (Table 1).

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>a,c,d</sup>			
		Production		Protection	Total
		Natural	Planted		
20.3–22.1	22,000	18,400	72	2,860	21,332

**Planted forests.** The area of industrial forest plantations is variously estimated at 55,000 hectares<sup>b</sup>, 72,000 hectares<sup>a</sup> and 83,000 hectares (FAO 2005). About 10,000 hectares of timber plantations have been set up in the Mayombe region. Most of these have been established in order to develop low-fertility savannas by introducing eucalypts (mainly high-performance clones and hybrids). There are also some oil-palm and rubber plantations in southern Congo.

## Institutional arrangements

**Forest tenure.** According to the current (2000) forest law (see below), there are two types of forest ownership: state forest and private forest. State forest can belong to government, local councils (*collectivités locales*) and public bodies. Once declared, any community and communal forest is registered as the private domain of the relevant group. According to Law 32/82 of 1982, access is free and user rights are granted to local people in non-classified forests. Local people are also allowed to harvest palm trees, rattan, leaves of *Gnetum*, etc, as well as single trees for lumber and firewood – including for commercial use.

**SFM policy framework.** The broad policies for SFM are set out in the Program of Social and Economic Development (2000–2003) and the National Forestry Action Plan. The objectives include: the adoption of a master plan for forest management in Congo, the creation and management of forest by appropriate silvicultural techniques, the adoption of agroforestry systems that provide sound soil and vegetation management, and the adding of value to wood and non-wood forest products. In 2001, Congo developed its own set of C&I based on those of ITTO and ATO; these were first tested with the private sector in 2002 and are expected to be used for monitoring SFM in FMUs.

**Forest policy and legislation.** Congo has important forest resources that have been relatively little used in the past. Nevertheless, the country has had a set of related laws and regulations for 30 years. A new forest code (Law 16/00) was adopted in November 2000 and new regulations and taxation systems are being prepared. Together, these will provide a legal framework that integrates all the principles of SFM. According to the new law, state forest is divided into permanent and non-permanent forest estates, the PFE comprising the state forest estate

(*le domaine forestier de l'état*), which is forest belonging to the state, local communities and public bodies. The non-permanent forest estate comprises the public forest estate (*le domaine public de l'état*), which is forest that has not yet been classified.

A fauna and protected-areas code and a land-use code are being drawn up to replace the Land Use and National Estate Code (Law 52/83), which has never been applied by decree.

**Institutions involved in forests.** The main institution in charge of forests is the Ministry of Forestry Economy and Environment (*Ministère de l'Economie Forestière et de l'Environnement* – MEFE). The 2000 forest code provides for the setting up of a forestry fund into which will be paid a proportion of the taxes levied in the sector. These will accrue to MEFE in order to facilitate its activities and consolidate its investments. New bodies and centres set up by the forest code include the General Forest Economy Inspectorate, responsible for internal auditing, inspection and control; the National Timber Trade Information and Statistics Centre; and the National Inventory and Forest Management Centre (*Centre National d'Inventaire et d'Aménagements des Ressources Forestières et Fauniques* – CNIAF), responsible as an independent body for all aspects related to forest management plans. There appears to be considerable political will to put in place an SFM regime<sup>b</sup>, but the institutional capacity to follow through on this is still very weak<sup>a</sup>.

The present governmental structure has evolved as a result of a military coup in 1997 followed by civil war until early 2000 and elections in 2002. The country's socioeconomic development is based on central planning and a strong public service including parastatal companies. The country is now moving towards privatization, but not yet the devolution of state functions.

Several international NGOs operate in Congo, including WCS and WRI.

## Status of forest management

### Forest for production

The production PFE is divided into 34 FMUs. All management, production, conservation, silviculture and infrastructure development is conducted



**Table 2 Some commonly harvested species for industrial roundwood<sup>c</sup>**

Timber species	Remarks
<i>Entandrophragma cylindricum</i> (sapelli)	30–60% of the total volume harvested, 100% for export
<i>Triplochiton scleroxylon</i> (ayous)	Light-colored timber, used in Europe to replace birch in sauna construction
<i>Entandrophragma utile</i> (sipo)	Decorative species, important for veneer
<i>Chlorophora excelsa</i> (iroko)	Traditionally one of the most popular dark hardwoods
<i>Millettia laurentii</i> (wengé)	Fine dark wood for multiple high-quality uses

at the level of these FMUs. In 2002, an area of about 8.5 million hectares was allocated to timber harvesting and required management plans. At the beginning of 2003, there were 50 forest concessions (of differing legal status) and 31 mostly smaller units (*unités d'exploitation* and 'lots') in the south and 19 forest concessions for production and protection in the north<sup>c</sup>. Expatriate enterprises, mainly from Europe but also from Malaysia, Hong Kong and the Middle East, are of great importance and account for more than 80% of national timber production.

Forest management is very different between the southern Mayombe and Chaillu regions and the northern part of Congo. Southern forests have been harvested for more than 50 years. Most of these forests are degraded, and current timber harvesting is often the third or fourth re-entry into logged-over forests<sup>c</sup>. In addition, the former larger FMUs have been subdivided into smaller logging units, allowing mainly national extractors access to the timber resources. In the last ten years, more than 1 million hectares of forest have been allocated in lots of about 50,000 hectares each. Many of these have been subcontracted to logging operators without knowledge of, interest in or capital for forest management, and damage is widespread<sup>c</sup>. The approach to forest management in northern Congo is different. The integrity of large FMUs has been maintained and concessions allocated to large industrial companies with an annual production capacity of over 100,000 m<sup>3</sup>, large enough to invest in wood-processing units.

The 2000 forest code requires that FMUs have forest management plans. In theory, these plans are to be prepared by the forest administration in close collaboration with the forest concession-holders, but, in practice, the concession-holders

undertake most of the work. Some management plans were expected to be completed by mid 2004 and provide the basis for the first SFM units in the country. Inventories for commercial timber and regeneration have been carried out on at least 6.4 million hectares of forests of the PFE<sup>c</sup>. A new approach, recently applied in three FMUs in northern Congo, has integrated NWFPs as part of the resource inventory. On the basis of forest inventories carried out over the past 30 years, the annual potential sustainable timber yield from the forest is estimated to be about 2 million m<sup>3</sup>, based on a 40-year rotation<sup>c</sup>.

The allocation of concessions in the FMUs is attributed either through an industrial processing agreement (*convention de transformation industrielle*), a management and processing agreement (*convention d'aménagement et de transformation – CAT*) or a special permit (*permis special*). In addition to these, Article 65 of the 2000 forest code specifies another type (*les permis de coupe des bois de plantations*) for the harvesting of plantations. Enterprises that are candidates for the development of an FMU are selected by tender. Harvesting is carried out in designated areas according to an annual allowable cut (AAC), which corresponds to the maximum annual volume authorized by the forest administration. The AAC can only cover areas that have been subject to a full enumeration of all harvestable trees and the most sought-after species. Every year, concession-holders must submit a request for approval of the AAC, together with a map of tree enumeration (scale 1:20,000) and a map (1:50,000) indicating existing log yards, roads and skidding trails. Every three months the operator must submit to the forestry administration a summary account indicating the volume of production by species and destination.

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

Total	Natural			Planted			
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified	
18,400	8,440	1,300 <sup>c,*</sup>	0	1,300 <sup>c,d</sup>	72	45	0

\* Forest management plans are being prepared in most of the concessions in northern Congo; at the time of compilation one company, CIB, had submitted its plan for further consideration by the forest administration and two others were about to do so

**Silviculture and species selection.** Congo has a long tradition of forestry research and education, and there is broad scientific knowledge of silviculture and forest dynamics in natural and planted forests<sup>b</sup>. Under the 2000 forest code, management plans must specify the species selected for felling and for preservation, any silvicultural treatments including enrichment planting, and the silvicultural planning schedule for each harvesting plot. Felling cycles can vary between 25 and 50 years and harvestable diameters between 60 and 80 cm according to species. Harvesting in FMUs for which a management plan has not yet been approved should be preceded by a felling inventory for the specified area.

In northern Congo, 18 to 20 timber species are harvested, mainly for the export market. The five major timber species listed in Table 2 make up nearly 80% of total production. More species are used in southern Congo; the major species there are okoumé and *Gambeya africana* (longhi).

**Planted forest and trees outside the forest.** The most important industrial plantation species are clonal eucalypts, followed by various tropical pines. Limba has been planted extensively since 1949 with some success. There are some small-scale enrichment plantings using local species such as ayous, *Nauclea diderrichii* (bilinga) and *Entandrophragma angolense* (tiama). Okoumé has been planted or regenerated in southern Congo with limited success.

**Forest certification.** Congo is actively involved in the development of the Pan-African Certification Scheme based on the ATO/ITTO PCI. Foreign companies operating in northern Congo are showing some interest in forest management certification and at least one large operation is pursuing FSC certification.

**Estimate of the area of forest sustainably managed for production.** At least 1.3 million hectares of the natural-forest production PFE are thought to be under SFM (Table 3). This area comprises three FMUs located in northern Congo managed by *Congolaise Industrielle des Bois* (CIB). CIB, which has been in the region since 1959, applies – with the assistance of an ITTO project and WCS – high forest-management and social standards and is well advanced in a process of independent certification under the FSC scheme.

**Timber production and trade.** Total roundwood production was an estimated 2.45 million m<sup>3</sup> in 2003 (FAO 2005b), including an estimated 1.35 million m<sup>3</sup> of industrial roundwood (ITTO 2006 in prep.). Sawnwood production in that year was 168,000 m<sup>3</sup>, an increase over 1999 (74,000 m<sup>3</sup>) (ITTO 2004, ITTO 2006 in prep.). In 2003, Congo exported an estimated 738,000 m<sup>3</sup> of logs, 127,000 m<sup>3</sup> of sawnwood and 14,000 m<sup>3</sup> (almost all production) of veneer (ITTO 2006 in prep.). Production and transport costs for exporting timber are relatively high compared to other countries in the Congo Basin; labour costs are the second-highest in the region after Gabon<sup>c</sup>.

**Non-wood forest products.** Many foods, medicinal plants and condiments are collected in the closed forest area and savanna forests; these are mainly sold domestically. Fibres such as raphia and rônier leaves (*Borassus aethiopum*) are important products that are traded with neighbouring countries. Mammals (particularly antelopes), invertebrates, snails and fish are important sources of protein for forest-dwelling communities. The trade in wild meat now involves many species, including protected species such as apes and elephants in northern Congo; it has become a major problem since the opening-up of the forests to forest management<sup>c</sup>.

**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
2,860	2,860	3,660 <sup>a</sup>	380 <sup>a,d</sup>	380 <sup>a,d</sup>

## Forest for protection

**Soil and water.** According to MEFE, 3.66 million hectares of forests are managed primarily for soil and water protection<sup>a</sup>.

**Biological diversity.** Congo is host to more than 6,500 plant species, 200 mammal species and 500 bird species (government of Congo 2000). Fourteen mammals, four birds, two reptiles and 36 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, ten mammals, one bird and six plants are found in forests (IUCN 2004). Fifteen plant species are listed in CITES Appendix II, including one hardwood timber species, *Pericopsis elata* (CITES 2005).

**Protective measures in production forests.** Forest management plans are now compulsory for concession-holders. They prescribe measures to protect water flows, biodiversity and soils. Specific provision is to be made to preserve wildlife in production forests<sup>a</sup>.

**Extent of protected areas.** The first national park (Odzala) dates from 1935, and the second, Nouabale-Ndoki, was created in 1993. According to the government of Congo, three national parks have protected-area status equivalent to IUCN categories I and II covering a total area of nearly 2.3 million hectares, and eleven protected areas covering 1.4 million hectares are classified in IUCN categories III to VI<sup>a</sup>. Of the 14 protected areas, twelve (86%) are linked by forest corridors. According to UNEP-WCMC (2004), 2.86 million hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV, including 2.07 million hectares of lowland evergreen broad-leaved rainforest.

**Estimate of the area of forest sustainably managed for protection.** The Nouabale-Ndoki National Park (380,000 hectares) is covered by a fully-fledged management plan that is being implemented effectively; CIB is harvesting timber in its buffer zone and implementing measures to

further protect the integrity of the park. The park is therefore considered to be under SFM<sup>a,d</sup> (Table 4).

## Socioeconomic aspects

**Economic aspects.** In 2002, the forest industry contributed about 2% of GDP<sup>b</sup>. It is estimated that more than 8,000 people are employed in the forestry sector<sup>c</sup>; forestry is a particularly important employer in northern Congo.

**Livelihood values.** Wild meat and the gathering of edible fruits, nuts and roots are of great importance for forest-dependent local communities, particularly Pygmies in the closed forest. Leaves of *Gnetum* spp are widely used as vegetables. Fruits of *Irvingia gabonensis*, *Gambeya africana* and others are collected and eaten. The government's new procedures for forest management plans contain provisions for the local use of NWFPs.

**Social relations.** Communities living in or near primary forests rely heavily on hunting for subsistence, but this is often affected by logging and particularly the presence of logging camps. Over-hunting occurs in areas with rapid population growth caused by the opening-up of the forest frontier. Indeed, the wild-meat question and social relations between indigenous forest dwellers and migrants are possibly the biggest constraints to SFM in northern Congo<sup>b</sup>. Local populations often benefit from the long-term presence of forest industries, which construct roads that can be used for the transport of goods. Forest industries also establish medical services and schools and, to some extent, provide services that normally are the responsibility of government<sup>b</sup>.

## Summary

The Republic of Congo has a large forest resource, supportive government policies, little population pressure, and at least one large concessionaire well advanced along the path to SFM. The stage therefore seems set for the forestry sector – particularly in northern Congo – to expand the area of forest

under SFM, provided that issues related to local communities and the over-hunting of certain mammal species can be addressed.

### Key points

- The Republic of Congo has a large resource of closed tropical forests, particularly in the north, and a relatively low level of conversion to other uses, although there is significant encroachment in the southern forests.
- The PFE is an estimated 21.3 million hectares, comprising 18.4 million hectares of production forest, 2.86 million hectares of protection forest and 72,000 hectares of industrial timber plantations.
- At least 1.30 million hectares of the natural-forest production PFE, comprising the concession areas of CIB in northern Congo, are thought to be under SFM. Some 380,000 hectares of protection PFE are deemed to be so managed.
- The over-hunting of wild meat within concessions, and social relations between indigenous forest dwellers and migrants, are possibly the biggest constraints to SFM in northern Congo.
- Forestry administration is the responsibility of the Ministry of Forest Economy and the Environment (MEFE). Institutional capacity remains relatively weak.
- In the south, more than 1 million hectares of forest have been allocated for harvesting in lots of about 50,000 hectares to operators largely unskilled in forest management.
- In the north, concession-holders are expected to collaborate with MEFE in the development of forest management plans; inventories have been carried out on at least 6.4 million hectares.

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# CÔTE D'IVOIRE



\*For legend see page 58

## Forest resources

Côte d'Ivoire, which is situated on the Gulf of Guinea, has a total land area of 32.2 million hectares and a population of about 17 million people. The tropical moist forest belt extends inland from the coast in the southwest and southeast for more than 250 km; beyond the tropical forest belt lies extensive savanna. The western part of the country is in the Guinea highlands, in which the highest summits rise to more than 1,500 m above sea level. Estimates of forest cover vary from 7.12 million hectares (22% of the land area; FAO 2005a) to 11.7 million hectares<sup>a</sup>.

**Forest types.** Two main forest types can be distinguished in the rainforests of the south: wet evergreen and semi-deciduous. The former is poorly stocked in commercial species but contains *Uapaca*

spp, *Guarea cedrata* (bossé), *Tieghemella heckelii* (makoré), *Tarrietia utilis* (niangon) and *Triplochiton scleroxylon* (samba). The latter, occurring in the central and northern parts of the forested zone, was once rich in valuable timber species, including samba, *Mansonia altissima* (beté), *Nesogordonia papaverifera* (kotibé) and *Khaya ivorensis* (acajou).

**Dynamics of forest resource change.** FAO (2005) estimated the deforestation rate at 265,000 hectares per year in the period 1990–2000, which as a percentage of remaining forest cover was higher than in most other sub-Saharan tropical African countries. Deforestation is mainly caused by increased rural poverty and the need for subsistence agriculture. Timber theft and illegal logging are widespread and are the primary reasons for the degradation of natural forests<sup>c</sup>. Forests of both wet evergreen and semi-deciduous forest types outside protected areas are heavily degraded or in an early secondary stage<sup>c</sup>. Bushfires are widespread in the savanna and the transitional forest-savanna, especially in the north at the end of the dry season.

**Permanent forest estate.** The official PFE comprises the 230 classified forests (*forêts classées*) zoned for production and protection – which officially covered 4.24 million hectares in 2003<sup>a</sup> – as well as harvesting zones (*périmètres d'exploitation forestière* – PEFs; see below) in the rural zone (*domaine rural*)<sup>a</sup>. However, some of these areas have almost certainly been converted to non-forest uses; for example, an estimated 628,000 hectares of classified forest were cleared for subsistence and industrial agriculture between 1992 and 1997<sup>a</sup>. Table 1 shows an ITTO estimate of the actual PFE.

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>c,d,*</sup>			
		Production		Protection	Total
		Natural	Planted		
7.12–11.7	3,248	3,400**	167	734***	4,301

\* Only forests in the southwest and southeast are counted here; savanna forests are omitted

\*\* Production PFE comprises forested areas in forest reserves and the PEF of the *domaine rural*

\*\*\* Based on UNEP-WCMC (2004)

**Planted forests.** According to FAO (2001), Côte d'Ivoire had an estimated 116,000 hectares of planted forest in 2000. On the other hand, the government of Côte d'Ivoire estimated that the plantation estate in 2002 amounted to 167,000 hectares, including 65,000 hectares of *Tectona grandis* (teak)<sup>a</sup>. The most important non-forest tree plantations are oil palm (about 159,000 hectares), rubber (68,000 hectares) and coconut (32,000 hectares).

## Institutional arrangements

**Forest tenure.** There are two main categories of natural-forest ownership: (i) public forests, owned by the state, which are divided into two kinds of land-use: the *domaine forestier permanent*, which includes the reserved forest area and protected areas, and the *domaine rural*, which includes forest harvesting areas (PEFs) and forests reserved for agriculture purposes; and (ii) community forests, which are based on traditional customary rights recognized in all forest areas in the country.

**SFM policy framework.** In 1994, CIFOR conducted a case study on the introduction of C&I in Côte d'Ivoire. Since then, national criteria have been elaborated. In 2002 and 2003, regional workshops were held to introduce ITTO's C&I as an instrument to assess progress towards SFM. A new general forest policy framework was announced in 1999 that emphasizes the contribution of SFM to the sustainable development of the country.

**Forest policy and legislation.** The forest code dates from 1965 (Law 65-425). Since then, all major decisions on land-use, forest management, forest service organization and the commercialization of products have been taken by decrees or ministerial orders (*arrêtés*), including Decree 78-231 of 1978, which defined the management of the PFE and Decree 94-385 of 1994, which reformed forest harvesting. The basic law on wildlife protection and hunting also dates from 1965 (Law 65-255). A process supported by FAO commenced in 2003 to revise the forest code.

A forestry master plan (*Plan Directeur Forestier*) was formulated in 1988; when it was evaluated in 1998, a number of corrective measures were proposed to be included in the new forest policy.

In 2000, an inter-ministerial working group developed a new policy under the *Programme Cadre de Gestion des Forêts*.

**Institutions involved in forests.** The ministry in charge of forests has changed five times over the past nine years; since 2003, it has been the Ministry for Water and Forests (*Ministère des Eaux et Forêts* – MINEF). Ten regional offices (*directions régionales*) are in charge of forest protection and law enforcement. Field services are placed under the Society for Forest Development (*Société de Développement des Forêts* – SODEFOR), a government corporation created in 1966 and entrusted today with the management of the forest reserves and with technical advisory functions for planted forests and social forestry. Nearly 2,000 people are employed by MINEF and SODEFOR. By Decree 02/359, a national office for national parks and nature reserves (*Office Ivoirien des Parcs Nationaux et Réserves Naturelles*) was created in 2002 under the Ministry of Environment.

Forest management in the *domaine rural* is exclusively conducted by the private sector. Forest industry is organized in syndicates and is quite effective in defending its interests in the forest sector. A number of national and international NGOs are engaged in forest conservation and village development, including reforestation and agroforestry. Civil society is not actively involved in forest management *per se*.

## Status of forest management

### Forest for production

Two forest management systems are employed: in forest reserves, management is carried out by the state enterprise SODEFOR while in the permanent forest of the *domaine rural* it is carried out by private concession-holders. Until five years ago, forest harvesting in the *domaine rural* was based on a licence system called the PTE (*permis de transformation et d'exploitation*) system, which allocated areas of up to 2,500 hectares to a large number of concessionaires. With the new forest policy, the PTE system was abolished and replaced by a system based on PEFs. By law, a PEF is at least 25,000 hectares and is allocated for 15–20 years; it can be renewed if management by the concession-

**Table 2 Some commonly harvested species for industrial roundwood<sup>c</sup>**

Timber species
<i>Tectona grandis</i> (teak) – planted
<i>Triplochiton scleroxylon</i> (ayous)
<i>Ceiba pentandra</i> (fromager)
<i>Lophira alata</i> (azobé)
<i>Terminalia superba</i> (fraké)

holder is satisfactory. Concession-holders are obliged to present a forest management plan that includes a reforestation scheme and social investments for the rural population living in or adjacent to the PEF. Management plans for PEFs must also include prescriptions for sustained-yield harvesting, the silvicultural treatment of harvested forests and measures against wildfires.

In the past, timber was mainly harvested in reserved forest areas, but excessive extraction over the past 30 years has led to their depletion. Today, nearly 90% of timber is extracted from the forests of the *domaine rural*<sup>f</sup>. By mid 2002, 2.9 million hectares of forests in the *domaine rural* had been allocated as PEF, including 960,000 hectares of productive forests. Thirty-two concessions had so far been allocated, varying between 70,400 and 216,000 hectares in size<sup>c</sup>. The potential AAC is about 960,000 m<sup>3</sup>, but the amount extracted is far less. Management plans are required for PEFs, but few have been prepared and harvesting is still mainly based on high-grading the remaining high-value timber<sup>c</sup>.

In forest reserves, SODEFOR prepares and implements forest management plans; changes in the law being contemplated would allow forest reserves to be opened to private concession-holders. Forest management plans have been or are being prepared for 88 of the 230 existing forest reserves. In 2002, 25 forest reserves had an approved management plan and 1.5 million hectares were being managed. The size of the units varies, the smallest (Semien) being 3,381 hectares and the largest (Rapids-Grah) 315,000 hectares. Forest reserves are to be managed in perpetuity. In

2001, 232,180 m<sup>3</sup> of timber were harvested in forest reserves – far less than the AAC (approximately 1.2 million m<sup>3</sup>)<sup>c</sup>. At the beginning of 2004, nine forest reserves covering 1.11 million hectares were being managed by SODEFOR using the ITTO C&I for monitoring<sup>a</sup>. Forest management and law enforcement have been hindered by ongoing civil unrest, and illegal logging and deforestation are thought to be widespread.

**Silviculture and species selection.** Prescriptions for the silvicultural management of both natural forests and plantations were developed in the 1990s through a forest-sector project supported by the World Bank. They have been fully applied in some forest reserves (Irobo, Tene, Mopri and others), but not yet to the management of the whole PFE. So far, no silvicultural directives have been applied in the permanent forest of the *domaine rural*.

There are more than 700 hardwood species in the country, about fifty of which are utilized and traded. Besides those listed in Table 2, the most valuable species are *Terminalia ivorensis* (framiré), *Entandrophragma candollei* (kosipo), *Milicia excelsa* (iroko), beté, *Entandrophragma angolense* (tiama), *Lovoa trichilioides* (dibetou), bossé, kotibé, *Pterygota macrocarpa* (koto), acajou, *Canarium schweinfurthii* (aiélé), makoré, *Pycnanthus kombo* (ilomba), *Azelia africana* (lingué) and niangon. Côte d'Ivoire has made great efforts to market lesser-known species and these have boosted the sales and exports of previously rarely traded species such as *Copaifera salikounda* (etimoé) and *Chrysophyllum* spp (aniégré).

**Planted forest and trees outside the forest.** The development of planted forests goes back to 1927 when the first teak plantations were established, although most of the current plantation estate has been established since 1966. By far the most important species is teak, with 65,500 hectares planted in forest reserves. Today, teak is also the main exported timber. More than 35 species have been planted in forest reserves. The most important, after teak, are: fraké, 25,800 hectares; framiré, 11,500 hectares; *Cedrela odorata*, 10,100 hectares; *Gmelina arborea*, 6,500 hectares; samba, 3,600 hectares; acajou, 2,900 hectares; sipo, over 2,200 hectares; and niangon, 2,100 hectares<sup>c</sup>. Twenty-seven thousand hectares are

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

Total	Natural			Planted			
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified	
3,400	1,870*	1,110 <sup>c, **</sup>	0	277 <sup>c, d</sup>	167	120 <sup>c</sup>	0

\* The sum of PFE areas allocated in 2000 and active in 2002 (960,000 hectares) in the public domain, plus forest reserves intended for production (913,000 hectares)

\*\* Area of forest reserves in 2002 with clear management objectives and multipurpose management plans implemented by SODEFOR since 1997

registered as mixed hardwood plantations. Of the estimated 60,000 hectares or more of planted forest in the *domaine rural*, about 15,000 hectares have been recently created as community forests, often to produce firewood.

**Forest certification.** There is no forest certification scheme nor any certified forests in Côte d'Ivoire. A national certification working group started in 2002 but little progress has been reported so far.

**Estimate of the area of forest sustainably managed for production.** It is difficult to ascertain the status of forest management in Côte d'Ivoire. Even in the forests where the necessary elements of good forest management appear to be present, law enforcement is poor and illegal logging and deforestation widespread<sup>c</sup>. Nine forest reserves of 1.11 million hectares have been managed since 1997 according to fully-fledged forest management plans for production and protection (Rapides Grah, Scio, Haut Sassandra, Niègre, Haute Dodo, Goin Debe, Cavally, Niouniourou and Okromodou)<sup>a</sup>; about one-third of these forest reserves are considered to be managed sustainably<sup>c</sup>.

**Timber production and trade.** Total roundwood production in 2003 was an estimated 11.6 million m<sup>3</sup> (FAO 2005b). Industrial log production in Côte d'Ivoire fell from 5.3 million m<sup>3</sup> in 1977 (FOSA 2002) to 1.90 million m<sup>3</sup> in 2003 (ITTO 2006 in prep.). Sawnwoods like acajou, bété, niangon, makoré, aboudikro, sipo and iroko have become scarce in the past ten years, and plantation production is increasing in importance. Sawnwood production in 2003 was about 503,000 m<sup>3</sup>, veneer production amounted to 206,000 m<sup>3</sup> and plywood to 62,000 m<sup>3</sup> (ibid.). In 2003, the country exported 216,000 m<sup>3</sup>

of sawnwood (ibid.), down from 479,000 m<sup>3</sup> in 1999 (ITTO 2004). The country has banned the export of logs of all valuable timber species from natural forests: only teak from planted forests can be exported as logs.

**Non-wood forest products.** Many NWFPs are traded locally, as well as used for subsistence. Among the most important are bamboo, *Laccosperma* spp (rattan) and *Raphia* spp (raphia palm) for basketry, furniture and housing. More generally, NWFPs directly contribute to the livelihoods of the local population; NWFP extraction is probably increasing due to poor economic conditions.

### Forest for protection

**Soil and water.** A total area of 195,000 hectares is set aside in the nine forest reserves cited above for the protection of soil and water<sup>a</sup>.

**Biological diversity.** An inventory of biological diversity completed in 1999 found over 12,000 forest-dependent species, including 232 mammals, 712 birds, 134 reptiles, 76 amphibians and 3,517 trees<sup>a</sup>. Sixteen mammals, eleven birds, four reptiles, one amphibian and 66 plant species are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 30 mammals, nine birds, 13 reptiles and nine plants are found in forests (IUCN 2004). Fourteen plant species are listed in CITES Appendix II, including one hardwood timber species (*Pericopsis elata*) (CITES 2005).

**Protective measures in production forests.** Timber harvesting is limited in swampy areas, on steep slopes and along river tributaries; on these, a strip of 100 m to 1 km in width (according to their relative importance) is excluded from



**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
734	734	195	345	150 <sup>c</sup>

harvesting. Detailed prescriptions for biodiversity conservation are applied in the nine forest reserves that are managed by SODEFOR.

**Extent of protected areas.** Côte d'Ivoire's nine national parks, two nature reserves, one wildlife reserve, 17 botanic reserves and those parts of the nine forest reserves that are managed for water and soil conservation cover a total area of 2.02 million hectares (6% of the country's land area); of this, two national parks (Comoé, 1.15 million hectares, and Taï, 344,000 hectares) account for more than 60%. According to UNEP-WCMC (2004), 734,000 hectares of forest are in protected areas conforming to IUCN categories I-IV, including 490,300 hectares of lowland evergreen broadleaved rainforest.

**Estimate of the area of forest sustainably managed for protection.** Poaching and other illegal activities are thought to be a significant problem in many forested reserves<sup>c</sup>, due largely to a lack of sufficient financial resources for field-level enforcement<sup>a</sup>. About 345,000 hectares of protection PFE are covered by management plans, comprising the forest managed for soil and water conservation in the nine forest reserves managed by SODEFOR (195,000 hectares) and the Taï national park (150,000 hectares). In the latter, the management plan is being implemented effectively and this area is considered to be under SFM<sup>c</sup>.

### Socioeconomic aspects

**Economic aspects.** Until 20 years ago, timber was Côte d'Ivoire's third most important export by value, but the industry has declined as the forests have been logged over and cleared. The formal contribution of the forest sector to GDP was estimated to be 1% in 2002<sup>a</sup>.

**Livelihood values.** Forests are important in sustaining the livelihoods of many people. Edible and medicinal plants are collected in great quantities. Wild meat remains the main source of protein in

rural areas, even though hunting regulations are very restrictive. The volume of wild meat harvested is estimated to be more than 120 tonnes per year<sup>a</sup>. The consumption of fuelwood, including charcoal, is estimated to be more than 8 million m<sup>3</sup> per year.

**Social relations.** The forest code of 1965, which is still in force, does not specify any direct involvement of local people in forest management, although articles 16 and 20 set forth rights for riverine populations within the classified forest area. Social considerations have been taken into account in various more recent governmental decrees concerning forests. Relationships between concession-holders and local people are difficult in many forest areas; causes include disputes on harvesting, areas for reforestation and money matters. There are 6,705 registered sacred forests (*forêts sacrées*), covering an area of about 37,000 hectares<sup>a</sup>. Many more forests may have cultural and spiritual value but are not registered. In some areas, local communities support the protection of forest reserves from encroachment and bushfires. Moreover, local cooperatives and villages engage in reforestation.

### Summary

Côte d'Ivoire's 230 state-owned classified forests (*forêts classées*) have been over-harvested and have become depleted of timber; natural forests in the rural zone (*domain rural*) and planted forests are providing an increasing part of the timber supply. Institutional responsibility for forestry administration has changed several times in recent years, with the likely result of reducing administrative effectiveness. The level of enforcement of existing laws and decrees appears to be low in much of the PFE. Forest management plans are under preparation or have been prepared for the forest reserves, but few have been prepared for the *domain rural*. Illegal logging and deforestation are thought to be widespread, exacerbated by civil unrest.

## Key points

- Côte d'Ivoire has a relatively low forest cover which continues to diminish.
- The country has an estimated 4.30 million hectares of PFE, comprising 3.40 million hectares of natural production forest, 167,000 hectares of industrial timber plantations and 734,000 hectares of protection forest.
- The estimated area of production PFE under SFM is 277,000 hectares, which is about one-quarter of the forest reserves covered by management plans. About 150,000 hectares of protection PFE are considered to be so managed.
- Forestry administration is currently the responsibility of the Ministry for Water and Forests (MINEF), which operates under a 1965 forest code and subsequent decrees. A process to revise the code is under way.
- Ten regional offices are responsible for forest protection and law enforcement. SODEFOR, a government corporation, manages the forest reserves and provides advisory services.
- MINEF and SODEFOR employ 2,000 people combined.
- Concession-holders are obliged to present a forest management plan that includes a reforestation scheme and social investments for the rural population living in or adjacent to the forest.
- There is a discrepancy between the standards applied in the forest reserves of the PFE and in the *domaine rural*.
- There is conflict between communities and harvesting operators over the use of forests.
- Poaching is believed to be a significant problem.

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  - <sup>c</sup> Information derived from the report of, and discussions with participants at, a training workshop on ITTO criteria and indicators, held 27–30 August 2002, Abidjan, Côte d'Ivoire, attended by 35 people from government, civil society and the private sector.
  - <sup>d</sup> ITTO estimate
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# GABON



\*For legend see page 58

## Forest resources

Gabon has a land area of 26.8 million hectares and a population of about 1.3 million people. It is situated in the western part of the Congo Basin on the South Atlantic Ocean and is characterized by three biogeographic regions: a sedimentary basin in the west, containing forest and savanna; a medium-altitude Precambrian plateau (around 600 m above sea level), largely forested except for the Bateke Plateau in the east, which is natural savanna; and the scattered granite massifs in the north and south – Cristal Mountains, Mayombe and Chaillu – with altitudes ranging between 800 and 1,000 m, which are almost entirely forested. FAO (2005) estimated Gabon's total forest area to be 25.8 million hectares in 2000, which is more than 80% of the land area.

**Forest types.** There are three major forest types: (i) evergreen rainforest occurring in the west, which

has been heavily harvested, degraded and in some areas reduced to secondary forest characterized by the abundance of *Aucoumea klaineana* (okoumé) and *Dacryodes buettneri* (ozigo); (ii) the central Gabonese forest, covering most of the country, which is very similar to the closed moist forest found from Liberia to the Congo Basin, with many of the same tree species found throughout (eg *Canarium schweinfurthii* – aielé, *Lophira elata* – azobé, *Entandrophragma* spp, *Khaya* spp and *Triplochiton scleroxylon* – ayous); and (iii) a semi-deciduous forest type occurring in the northeast, characterized by a predominance of Maranthaceae (rattan) in the sub-layer and by a dominance of trees such as *Terminalia superba* (limba), *Millettia laurentii* (wengé) and ayous. Okoumé is absent in this forest type.

**Dynamics of forest resource change.** With a low overall population density and 60% of the population living in urban areas, there is little anthropogenic pressure on forest resources. FAO (2005) estimated the deforestation rate at less than 0.1% (about 10,000 hectares per year).

**Permanent forest estate.** The area of potential production forest is about 20 million hectares, of which 2.6 million hectares are in forest reserves. The government strategy envisages, in the long term, that 12 million hectares in the PFE will be managed – 8 million hectares of production forest and 4 million hectares under protected-area status (Amsallem et al. 2002); Table 1 shows an ITTO estimate of the current PFE. The *Direction Générale des Eaux et Forêts* is responsible for identifying the permanent forest area and areas suitable for other uses. A land-use plan has been completed for the First Forest Zone of Gabon (see 'forests for production' below), financed by ITTO; the Second Forest Zone plan, financed by the World Bank, is

Table 1 PFE

Estimated total forest area (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>d</sup>			
		Production		Protection	Total
		Natural	Planted		
25.8	21,800	10,600	25	2,700	13,325

under preparation. Almost all of the national production forest area within the PFE is allocated to concession-holders.

**Planted forests.** Planted forests cover about 25,000 hectares. The government plans to raise the area of planted state forest to 100,000 hectares and to promote the establishment of an additional 100,000 hectares of private plantations, but planting rates are currently minimal. Agro-industrial plantations include about 11,000 hectares of rubber and some small plots of oil palm and coconut.

## Institutional arrangements

**Forest tenure.** The forest law of 2001 (see below) divides forests into two distinct categories. The first includes the production PFE managed by private concessionaires and the protection PFE managed directly by the state. The second is composed of state-owned rural forest – land and forest for which usage rights are limited to local communities. Rural communities and forest dwellers are free to exercise their customary rights in the rural forest provided they respect all conditions imposed by the forestry administration. The production PFE is exclusively owned and administered by the state.

**SFM policy framework.** Since the timber sector is almost entirely oriented towards export markets, with particular exposure to environmentally sensitive European markets, the existence of a policy on SFM is of great interest. Several recent initiatives have been launched to develop Gabon-specific C&I for SFM. They include work with ITTO, CIFOR, ATO and FSC. Gabon has also been actively involved in the development of the ATO/ITTO PCI.

**Forest policy and legislation.** An environmental law (No 16/93) was adopted in 1993. It aims to preserve natural resources and to use them sustainably, to improve and protect living conditions, to generate revenues from environmental services, and to harmonize development with safeguarding the natural environment. A decree stipulating when and where environmental impact assessments are required also exists. A national environmental action plan has been funded by the Global Environment Facility (GEF). After extensive consultation at the national level, a new forest law was adopted in December 2001, replacing Law 1/82 of 1982; among other things, it defines the two main usage

categories of permanent and rural forest estates (see 'forest tenure' above).

Gabon's current forest policy was adopted in May 1996. It aims to increase and optimize the contribution of the forestry sector to economic and social development and to promote a more diversified and efficient wood industry through a significant reduction in the export of logs and an increase in the local processing of wood products. The policy makes specific reference to the application of SFM, including: the establishment of a forest management policy, the development of new forest harvesting rules, the introduction of means to monitor forest harvesting, the reform of timber licences to ensure wood supplies to local industries, the imposition of a progressive transformation tax on local forest production, and, finally, the progressive reduction of log exports from 75% of production in 1996 to 50% by the year 2005.

**Institutions involved in forests.** The Ministry of Forest Economy, Inland Waters and Fishing in Charge of the Environment and Nature Conservation (*Ministère de l'Économie Forestière, des Eaux, de la Pêche, Chargé de l'Environnement et de la Protection de la Nature* – MEFPEPN) deals with the demarcation, conservation, management, reforestation and harvesting of forests. The Directorate for Forests and Water (*Direction Générale des Eaux et Forêts* – DGEF) promotes the practice of SFM, and the Directorate of Forest Inventory, Management and Regeneration (*Direction des Inventaires, des Aménagements et de la Régénération des Forêts* – DIARF) is responsible for monitoring SFM. There is also a planning, monitoring and evaluation unit in the Ministry to supervise operational activities. In 1975, the government created a privately managed timber enterprise (*Société Nationale des Bois du Gabon* – SNBG), which, until recently, had a monopoly over the export of logs of the two main species, okoumé and ozigo. SNBG supported the regulation of markets for these species by structuring supply, preventing over-production, setting quotas and acting to stabilize export prices. SNBG's monopoly was ended by the government in early 2005.

There are five research institutions dealing with forest-related issues and one forestry training institute, ENEF (*Ecole Nationale des Eaux et Forêts*). Since 2004, the management of 13 national parks

has been carried out by the National Council for National Parks (*Conseil National des Parcs Nationaux* – CNPN). Some local NGOs are involved in the development of certification, but in general there is little civil advocacy and few participatory processes in the forestry sector<sup>b</sup>. Some international NGOs, including WWF and WCS, are active in protected-area management.

## Status of forest management

### Forest for production

All production forests must have an SFM plan prepared by the concessionaires, approved by MEFEPEPN, covering one rotation and based on forest inventories and ecological and socio-economic studies. Licences for harvesting production forests are granted in two ways<sup>b</sup>:

- forest concessions under sustainable management (*concessions forestières sous aménagement durable* – CFADs): these concessions, of 50,000 to 200,000 hectares according to the 2001 forest law, consist of one or several FMUs. Each FMU, of between 15,000 and 200,000 hectares, is regulated by a licence. According to the 2001 law, each FMU requires the preparation and implementation of a forest management plan as well as a timber-processing plan. CFADs are granted at least for the rotation period established in the management plan(s), generally between 20 and 40 years. The granting of any such concession is conditional on the establishment of a local timber-processing unit; and
- associated forest licences (*permis forestiers associés* – PFAs), with an area of less than 15,000 hectares, are granted for a ten-year period. They are reserved for Gabonese nationals and must be linked to a CFAD.

In addition, occasional cutting permits (*permis gré-à-gré*), linked with the local processing of the harvested timber, may be granted to Gabonese nationals. These permits are granted in reserved forests outside CFAD and PFA areas.

Community forests may be created in rural forests. These should be managed for timber and NWFPs according to a simplified forest management plan

developed with support from the DGEF. Up to 2004, few community forests had been established<sup>b</sup>.

The forest area open to timber harvesting has been divided into three zones. The first, reserved for national enterprises, comprises the coastal plains and is rich in okoumé and characterized by relatively easy transport. Most of this zone has been harvested one to three times since the end of the 19th century (Drouineau & Nasi 1999). The second zone is less rich in okoumé and access is more difficult. This zone has now been almost completely harvested for the first time (*ibid.*), facilitated by the establishment of the *Transgabonais*, the railway that has granted access to a large part of the centre and east of the country. Still less okoumé is found in the forests of the third zone, where the species reaches the limits of its distribution. The *Transgabonais* provides limited access to this zone but extraction becomes increasingly difficult farther from the railroad. As a consequence, there has been little harvesting so far (*ibid.*).

At the end of 2002, there were 401 timber permits of all categories in force covering a total production area of 10.62 million hectares. Forty-three per cent of the area (4.55 million hectares) was being harvested on an industrial scale. This was divided into 63 FMUs, 45 (3.3 million hectares) of which were being harvested by foreign timber concession companies – eight European holdings, seven Asian holdings and one Libyan enterprise. All concessions equal to or larger than 50,000 hectares require a forest management plan. By the end of 2002, about 1.46 million hectares of forest had already been covered by forest management plans, and forest inventories were under way in an additional 1.1 million hectares. In 2003, sixteen concessionaires were preparing forest management plans. It is expected that 6.7 million hectares allocated under CFADs will be managed according to approved forest management plans by the end of 2005 (Gabonese forestry officials, pers. comm., June 2005).

**Silviculture and species selection.** Timber harvesting is selective and focuses on high-value species; at present, only 4–5 m<sup>3</sup> per hectare is extracted. In the first and second forest zones, this is due to previous overcutting of okoumé; in the east, high transport costs mean it is only economically viable to harvest the most valuable tree species.

**Table 2 Some commonly harvested species for industrial roundwood**

Timber species	Remarks
<i>Aucoumea klaineana</i> (okoumé)	About 1.7 million m <sup>3</sup> of logs exported in 2001
<i>Pterocarpus soyauxii</i> (padouk, red wood)	Important species for log export
<i>Guibourtia tessmanii</i> (kévazingo)	Decorative species, important for veneer, parquet, small handicrafts
<i>Dacryodes buettneri</i> (ozigo)	Traditionally the second most important timber species, now losing significance
<i>Hallea ciliata</i> (bahia)	Dominant in swamp forests

The gross standing volume of trees with diameter above 10 cm is estimated to be 250 m<sup>3</sup> per hectare in unexploited forest and 220 m<sup>3</sup> per hectare in logged-over forest. The commercial standing volumes are respectively 55 m<sup>3</sup> per hectare and 42 m<sup>3</sup> per hectare. Generally, forest resources can be divided into two main categories: forests with okoumé and ozigo, which regenerate well, and forests without large amounts of these two species. Okoumé is the predominant species, with about 10 m<sup>3</sup> per hectare in about 80% of all forests. A specific silvicultural system is applied, the so-called *Méthode Okoumé*, based on favouring natural regeneration and continuous thinning until there are 80 stems per hectare with a diameter of over 70 cm. Gabonese forests regenerate well and, if management prescriptions are followed, they will maintain their productive value (Drouineau & Nasi 1999).

Over the past decade, a growing number of the approximately 400 hardwood tree species in Gabon's closed forests have been harvested, mostly for domestic or Asian markets. It is expected that the number of species acceptable to international markets will continue to increase from the current 15 or so to 30–40, including azobé, ayous and *Gambeya africana* (longhi).

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

Reforestation and enrichment planting are generally not undertaken in logged-over forests due to the relative ease of natural regeneration. Existing plantations are mainly on former natural-forest sites and consist primarily of okoumé and, to a limited extent, limba. There are also some plantations of pines and clonal eucalypts.

**Forest certification.** Since 2001, a national working group on SFM and certification, financed by the

EU and the Dutch government, has been actively involved in setting standards and establishing the base conditions for forest certification. Most of the major European concessions apply the Dutch Keurhout certification scheme, with almost 1.5 million hectares certified under this scheme as of 2004. It is expected that the biggest forest concessions will also seek certification under either the FSC or the Pan-African Forest Certification (PAFC) system, which was established in Gabon in late 2004 based on the ATO/ITTO PCI. PAFC-Gabon is the first African member of the Program for the Endorsement of Forest Certification Schemes (PEFC) Council; in order to be PEFC-endorsed and to use the PEFC logo, PAFC-Gabon needs to complete development of the national scheme and submit it to PEFC assessment procedures (including an independent review and public consultation).

#### **Estimate of the area of forest sustainably managed for production.**

At least 1.48 million hectares of natural-forest production PFE are thought to be under SFM. This corresponds to the long-term concession area leased out to timber companies that have achieved certification under the Keurhout scheme.

**Timber production and trade.** The total standing timber volume (diameter >10 cm) is estimated to be 2.60 billion m<sup>3</sup>. The possible sustainable annual yield of potentially marketable timber species is an estimated 12–15 million m<sup>3</sup> (government of Gabon 2001). In 2003, 3.56 million m<sup>3</sup> of industrial logs were produced (ITTO 2005), not much changed from the 3.64 million m<sup>3</sup> harvested in 1999 (ITTO 2004). The government plans to raise the level of harvest to 6.5 million m<sup>3</sup> (government of Gabon 2001). Local industrial processing is promoted by

**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
10,600	6,923	2,310*	1,480	1,480	25	10	0

\* All 401 cutting permits in force in 2002–03 are counted here

the government, including by the imposition of a 20% tax on log exports, and has increased during the last five years; for example, veneer production grew by about 50% in the three years to 2003, when it reached 140,000 m<sup>3</sup>. Nevertheless, Gabon remains one of the largest exporters of tropical hardwood logs. China and Taiwan Province of China absorbed more than half (988,000 m<sup>3</sup>) of Gabon's log exports in 2003, with most of the rest going to Europe (ITTO 2005).

**Non-wood forest products.** As in the other countries of the Congo Basin, many foodstuffs, including wild meat, roots, fruits, leaves and nuts, as well as medicinal plants and condiments, are collected in the forest. They are an integral part of the subsistence of local people, but some are also marketed at the national level, such as the fruits of *Irvingia*, lianas of *Gnetum*, and plants and nuts of *Garcinia* species. Bamboo and fibres such as Marantaceae (rattan), raphia, and the leaves of *Borassus aethiopum* (rônier) are important products that are also traded internationally. Charcoal is of some importance, supplying a small but efficient informal market.

### Forest for protection

**Soil and water.** As of 2004, no forests were reported to be managed primarily for the protection of soil and water<sup>a</sup>.

**Biological diversity.** Gabon contains more than 6,500 plant species, 320 mammals and 617 birds. Thirteen mammals, five birds, three reptiles, two amphibians and 108 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, ten mammals, two birds, two amphibians and 44 plants are found in forests (IUCN 2004). Gabon has listed eleven plant species in CITES Appendix II, none of which is a hardwood timber species (CITES 2005). Although Gabon is sparsely

populated, some fauna species are under pressure in some areas due to an increasing demand for wild meat (Amsallem et al. 2001).

**Protective measures in production forests.** Law 16/01 includes measures to protect soil, biodiversity and water flow in concession areas. It also includes a series of stand treatments to encourage the regeneration of commercial tree species in natural stands. Provisions designed to protect wildlife specify the zones where hunting is permitted and the length and dates of the hunting season. These rules need to be enforced in forest concessions, as concessionaires and their personnel have so far done little to control poachers (Amsallem et al. 2001).

**Extent of protected areas.** Gabon has 13 national parks – most of them forested – covering about 3.01 million hectares<sup>a</sup>, although none appear to be managed effectively except for the Lopé National Park and the Minkebe National Park<sup>d</sup>. The CNPN focuses on ecotourism as well as nature conservation in park management but its main activities are concentrated on fighting poaching. Parks outside the Lopé National Park require more protection, particularly the Mounts of Cristal, the Clump of Chaillu, the Mayombe, the whole northeast of the country, the Belinga Zone and the Mounts of Boka-Boka. According to UNEP-WCMC (2004), 570,000 hectares of forest are in protected areas that conform to IUCN protected-area categories I–IV. A National Biodiversity Observation Board was created in 2000 to support the implementation of the GEF-assisted National Strategy and Action Plan for Biodiversity. ITTO and WWF are working with the government to develop a project that would prepare a management plan for the Minkebe Forest Reserve, which together with the Minkebe National Park makes up an ITTO-supported trans-boundary conservation area linked to the Mengame protected area in Cameroon.

**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
2,700*	570	0	491**	1,090

\* National parks only

\*\* A management plan for the Minkebe National Park and the Minkebe Forest Reserve is in the final stages of preparation

**Estimate of the area of forest sustainably managed for protection.** The total protection PFE under SFM is an estimated 1.09 million hectares (Table 4), comprising the ITTO-supported Minkebe National Park (600,000 hectares) and the Lopé National Park (491,000 hectares). These areas are considered to be managed and protected effectively, although poachers continue to be a threat to these and other protected areas.

### Socioeconomic aspects

**Economic aspects.** Timber and wood industries play an important role in the economy of Gabon. Before the petroleum industry was established in the 1950s, timber provided 90% of export earnings but by 1985 this had diminished to 6%. Timber remains the second-largest source of export earnings after petroleum, earning about US\$250 million per year, now around 9% of export revenue. It is estimated that the timber industry's contribution to GDP is 5% (government of Gabon 2001). Forest taxes are primarily (>90%) derived from export levies. The country has engaged in fiscal reforms to increase and diversify income from taxes and to provide incentives for SFM and wood processing. Forestry and wood industries employ about 29,000 people (government of Gabon 2001). In order to implement its SFM policy, the government has created a National Forest Fund and an investment program with the World Bank (*Programme Sectoriel Forêt-Environnement*) that aims to pursue institutional and statutory reforms.

**Livelihood values.** Forests are the main source of subsistence for many villages. Local populations have free access to all forests as long as they possess appropriate customary rights and do not jeopardize the sustainability of the forest products they collect. Wild meat and edible fruits such as aiéle, leaves of *Gnetum* species, and nuts and roots (igname) are of great importance for forest-dependent

local communities, in particular Pygmies. Wild-meat availability may be threatened locally because of overhunting.

**Social relations.** The community forests allowed under the 2001 forest law replace the former 'family logging' rights. The forest law specifies that there should be a zone around each production forest to accommodate the customary rights of surrounding communities. One of the objectives of a memorandum (*lettre de politique*) of forest policy published by the government in May 2004 is to increase the future role of local users in community forest management.

### Summary

Over the past ten years, Gabon has gone through a profound process of reform affecting the forest and environment. A new forest law has come into force that emphasizes SFM as the overall approach in the PFE. Forestry is, and will remain, one of the pillars of Gabon's economic and social development. The private sector has become a major driver of industrial forest development and the export of forest products. The government has introduced a system to institutionalize community forestry as a way of meeting local needs for timber and other forest products. Gabon has a low deforestation rate, forests rich in valuable timber species and among the best prospects for a healthy and sustainable forest industry. There are still problems – mainly in governance. For example, there is little civil advocacy and few participatory processes in the forestry sector. Protected-area management in Gabon is still in its infancy and requires greater planning and effective enforcement.

### Key points

- Gabon has timber-rich and extensive forest resources with a relatively low risk of conversion to other uses.



- The PFE is an estimated 13.3 million hectares, comprising 10.6 million hectares of natural production forest, 2.70 million hectares of protection forest and 25,000 hectares of plantations.
- At least 1.48 million hectares of natural-forest production PFE are thought to be managed sustainably; at least 1.09 million hectares of the protection PFE are considered to be so managed.
- The financial viability of SFM is greatly enhanced by the high quantity and quality of a prime species (okoumé) in a large part of the forest estate, particularly on the coastal plains.
- However, because of its high value, okoumé tends to be over-harvested.
- Community forests may be created in rural forests, but few had been as of 2004.
- High standards for concession management have been developed on paper, but still need to be fully introduced and enforced. There is interest in the application of C&I as a monitoring tool and forest certification has been encouraged.
- Many protected areas do not appear to be managed effectively.
- Management for wild meat and other NWFPs is still largely uncontrolled in forest concessions.

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# GHANA



\* For legend see page 58

## Forest resources

Ghana has a land area of 23.9 million hectares and a population of about 20.5 million people. It is located on the west coast of Africa, bordered by Togo in the east, Côte d'Ivoire in the west, Burkina Faso in the north and the Atlantic Ocean in the south. Ecologically the country is divided into a high-forest zone in the south, accounting for about a third of the land area (8 million hectares), a savanna zone (14.7 million hectares) mostly in the north, and a transition zone (1.1 million hectares). Estimates of the total area of forests in the country range from 2.72 million hectares<sup>a</sup> to 6.34 million hectares (FAO 2005), the former estimate excluding non-PFE savanna.

**Forest types.** The broad forest types are rainforest (47%), moist tropical forest (32%) and dry tropical forest (21%); specific vegetation types include low

grass savanna, savanna woodland, wet and moist deciduous forest, evergreen forest, coastal savanna and mangrove swamp. The main timber-producing areas are the deciduous and evergreen forests in the southwest. The main species in the deciduous forests are *Triplochiton scleroxylon* (wawa), *Mansonia altissima* (mansonia), *Nesogordonia papaverifera* (danta) and *Khaya ivorensis* (mahogany); and in the evergreen forests *Guarea cedrata* (guarea), *Tieghemella heckelii* (makore), *Tarrietia utilis* (niangon) and *Uapaca* spp (assam).

**Dynamics of forest resource change.** Deforestation in Ghana usually commences with the degradation of well-stocked forests by excessive (often illegal) logging, slash-and-burn agriculture, mining and quarrying, and fuelwood collection. Degraded forests are then often completely deforested by wildfire, illegal occupation and/or land-use changes. These destructive forces are influenced by population pressure and poverty and also by infrastructure and economic development programs. Road construction near or within forest reserves facilitates encroachment. Internal migration to the western forests for cash-crop cultivation accounts for the high rate of forest degradation in those areas. Almost all forests have suffered depletion, creating eroded hillsides in some cases and destroying genetic diversity in others<sup>c</sup>. The average estimated annual rate of deforestation between 1990 and 2000 was 120,000 hectares; the average growing stock in the remaining forest area is only 49 m<sup>3</sup> per hectare (FAO 2005).

Forest fires occur regularly and cause severe damage; the annual financial loss due to wildfires is estimated to be about US\$24 million<sup>a</sup>. Excessive logging can make the forests more vulnerable to fire by causing the accumulation of residues, which become readily flammable when dry.

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		
2.72-6.34	1,634	1,150 <sup>c</sup>	97 <sup>a</sup>	353	1,600

**Permanent forest estate.** There are 204 forest reserves in the high-forest zone covering an area of 1.62 million hectares and 62 forest reserves in the savanna zone covering 600,000 hectares<sup>a</sup>. The forests in the high-forest zone are functionally classified as: timber production, 762,400 hectares (47%); permanent protection, 352,500 hectares (22%); rehabilitation, 122,000 hectares (7%); conversion, 127,000 hectares (8%); and not inventoried, 270,000 hectares (16%)<sup>a</sup>. The area of natural-forest PFE is estimated to be the sum of all these except conversion forests. Since the reserves in the savanna zone are not closed forest, they are not included in the PFE area estimate.

**Planted forests.** The estimated area of planted forest in 2003 was about 97,000 hectares (PFE only)<sup>a</sup>. Ghana began planting *Tectona grandis* (teak) in the Volta region in 1875, and teak is the most dominant species in today's plantation estate. More than 50,000 hectares of new planted forest was established between 2000 and 2004, 60% of it teak<sup>c</sup>. Additionally, there are agro-industrial plantations of rubber (19,000 hectares), coconut (40,000 hectares) and oil palm (37,000 hectares).

## Institutional arrangements

**Forest tenure.** Traditionally owned forest lands, known variously as 'stool land' or 'skin land', were, in the past, under the full control of tribal chiefs or kings. Until 1970, usufruct rights over forest resources were totally under their authority based on customary laws. In the early 1970s, all rights for the management and development of natural resources (but not land ownership itself) were transferred to the President of Ghana (as a trust for the 'stools' or 'skins' and their people) to harmonize the various traditional land-tenure systems and reduce political conflicts. The transfer of forests to the national government facilitated central planning and allowed the harmonization of forest management systems and investment procedures. However, members of landholding groups were still allowed full usufruct rights.

**Forest policy and legislation.** The first forest policy was established in 1947; this was revised in line with Ghana's 1992 constitution and approved in 1994 as the Forest and Wildlife Policy. The policy contains five specific objectives related to: the management of the PFE for the conservation of soil, water and biodiversity; the development of

viable and efficient forest-based industries; public awareness and the involvement of rural people in forestry and wildlife conservation; research-based and technology-led forestry and wildlife management; and the development of capacity in SFM. To date this policy has been implemented most effectively within the forest reserves, with off-reserve forests often unregulated and over- or illegally harvested<sup>c</sup>. Forests are owned by communities through traditional authorities, managed by government, and logged/utilized by private contractors. These arrangements, specified in the 1992 constitution, are reflected in the 1997 Timber Resource Management Act and the 1999 Forestry Commission Act. In general, Ghana's forest-related laws, policies and regulations are somewhat confusing and fines for breaches are low<sup>a</sup>.

A Forestry Development Master Plan (1996–2020) was launched to guide the implementation of the Forest and Wildlife Policy. The master plan is being implemented through a multi-donor-assisted ten-year program called the National Resources Management Programme (NRMP), which has four components: high forest, savanna, wildlife resource management and biodiversity conservation in the high-forest zone.

**Institutions involved in forests.** The main institution in charge of forests is the Ministry of Lands and Forestry (MLF) supported by the Forestry Commission (FC), which was established in 1980, and the FC divisions of Forestry, Wildlife, and Timber Industry Development. The FC was restructured as a semi-autonomous corporate body in 1999 under Act 571 as a semi-autonomous corporate body to improve its effectiveness. In addition, the public forest-sector agencies responsible for the protection, development, management and regulation of forest and wildlife resources were brought under its purview. Some 580 professional and technical forestry personnel are employed by the government<sup>a</sup>.

The main institutions involved in forestry research are the MLF's Forest Plantation Development Centre; the Forestry Research Institute of Ghana (FORIG) under the Ministry of Environment, Science and Technology; the Renewable Natural Resources Institute of Ghana; and the University of Ghana<sup>a</sup>.

Community participation in forestry is being facilitated through community forest committees (CFCs) and a collaborative forest management unit of the FC<sup>c</sup>; in 2003, there were some 100 CFCs. Local NGOs such as the Green Earth Organisation

and the Ghana Association for the Conservation of Nature and international NGOs such as Friends of the Earth (Ghana), Conservation International and World Vision are active in forestry. The Timber and Wood Workers Union of the Trade Union Congress of Ghana is also an important stakeholder. However, there are often problems of coordination between the trade union, NGOs and government forestry agencies<sup>c</sup>.

## Status of forest management

### Forest for production

The ITTO C&I and ATO/ITTO PCI are incorporated in the FC's various forest-management manuals and guidelines, providing a cornerstone for natural forest management. Holders of timber utilization contracts (see below) and other forest operators are required to follow the Ghana Manual of Procedures for Forest Management and Procedures Relating to Timber Operations in Ghana, prepared under the 1997 Timber Resources Management Act and the 1998 Timber Resources Management Regulations, which together seek to ensure that timber rights are granted in a manner conducive to SFM. The Timber Resources Management (Amendment) Act of 2002 (No 617), which does not encompass private forest plantations, establishes maximum durations and area limits for timber rights and provides incentives for investors; these incentives promote strategic investments in the forest sector (Section 14 C).

Until 1991, the conventional forest concession was the common arrangement for timber harvesting. This system followed basic forest-management requirements such as harvest planning, standards for road-building and tree marking, pre-harvest operations, environmental conservation and enrichment planting. It was based on selection felling using an AAC calculated for a 40-year cycle. However, implementation in the field was not satisfactory and did not always follow the legal requirements for forest management. The maximum area granted to a concession-holder was 50,000 hectares, with the average size of an FMU being 20,000 hectares. AACs were often exceeded. Over-harvesting led to the downward revision of the national AAC in forest reserves from 1.2 million m<sup>3</sup> in 1990 to 683,000 m<sup>3</sup> in 1995<sup>a</sup>. Commercial species were grouped into 'scarlet', 'red' and pink' groupings.

'Scarlet' species were being over-cut at a rate greater than 200% the estimated sustainable yield and were thought to be under threat of economic extinction, 'red' species were being cut at a rate of 50–200% the sustainable yield, and 'pink' species were being harvested at less than 50% the sustained yield<sup>a</sup>.

The Forests and Wildlife Policy of 1994 abolished the concession system and replaced it with a new timber utilization contract (TUC) system (LI 1721), which was intended to promote efficiency, transparency and accountability.

The FC uses manuals for production, management and planning such as the 1998 Manual of Procedures for Forest Resource Management Planning in the High-forest Zone, the Manual of Procedures for Stock Survey and Yield Allocation (1995), and the 1998 timber resources management regulations. According to the 1998 manual for the high-forest zone, logging plans are prepared by the contractor, logging contract licences range from one to 40 years, and the forest reserves are divided into compartments of 128 hectares each (1,600 m x 800 m). The 2002 Law on Timber Resource Auctioning establishes that timber rights will be awarded by tender. The FC allocates the volumes to be harvested annually based on an 'interim yield formula', which depends on the size of the TUC area; a national AAC has been set at 500,000 m<sup>3</sup> based on the adoption of a rotation of 40 years. The entire production PFE (1.15 million hectares) is covered by management plans and 100% of the forest boundaries have been demarcated<sup>a,c</sup>. The management of many forest reserves is thought to be quite good. In others, however, inadequate control of TUCs has allowed over-harvesting. Repeated re-entries take place depending on demand for logs, often facilitated through salvage permits. There is inadequate surveillance to safeguard the integrity and ensure the security of the PFE. There are also inadequacies in survey records, maps and boundary maintenance<sup>c</sup>. Landowners often do not show any interest in forest protection and management. Timber royalties have traditionally been poorly collected and inequitably distributed; as a result, forest revenues often do not cover the cost of forest management<sup>c</sup>. Moreover, illegal logging is reportedly widespread<sup>c</sup>. Illegal chainsaw operators, for example, feed a thriving domestic timber market, often selling their wood from roadside stalls with little

**Table 2 Some commonly harvested species for industrial roundwood<sup>c</sup>**

Timber species	Remarks
<i>Tectona grandis</i> (teak)	Plantation species
<i>Triplochiton scleroxylon</i> (wawa)	All-purpose wood
<i>Ceiba pentandra</i> (fromager)	Off-reserve tree, used by industry for export veneer
<i>Aningeria robusta</i> (asanfina)	Sawnwood, veneer
<i>Terminalia superba</i> (offam)	Good for sawmilling and veneer production

or no government oversight. The formal wood industry has traditionally concentrated on exports. Due partly to over-capacity in export-oriented mills (see below), the volume of timber available for domestic use is much lower than the demand; supplies, therefore, are supplemented by illegal logging. Moreover, farmers who plant in forest openings are generally not adequately compensated for crop damage caused by timber harvesting, leading some of them to destroy trees and/or collaborate with the chainsaw operators to process them, thereby receiving a share of the illegal proceeds<sup>c</sup>.

**Silviculture and species selection.** The silvicultural system used in natural forests is a polycyclic selection felling system using a cutting cycle of 40 years. The AAC in the natural forests is decided on the basis of stock surveys and size limits prescribed for the different commercial species by the Forest Services Division of the FC. Only 20% of the trees above the diameter limit are to be harvested (around three trees per hectare), with the rest retained for the next entry in 40 years. Post-logging silvicultural operations are also prescribed to promote growth and sustainability.

There are many hardwood timber species, but the more commercially valuable are becoming scarce. Table 2 lists some of these commonly harvested timber species. In addition to the species listed in the table, some 30 lesser-used species are classified as 'pink', including *Celtis* spp (esa), *Piptadeniastrum africanum* (dahoma), *Entandrophragma candollei* (kosipo), *Milicia excelsa* (iroko), *Entandrophragma angolense* (edinam), *Pterygota macrocarpa* (koto), makore, *Pycnanthus angolensis* (otie), *Pouteria robusta*, *Chrysophyllum* spp (alcasa), *Khaya anthotheca*, *Entandrophragma cylindricum* (sapele) and *Antiaris africana* (kyenkyen).

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

Plantations are managed by clearfelling and replanting. The major planted species is teak, with the remaining area under other broadleaved species such as *Cedrela odorata*, *Gmelina arborea*, *Terminalia superba*, *T. ivorensis*, *Triplochiton scleroxylon* and *Khaya* spp. Teak has become the most attractive species for afforestation over the last 15 years. Yields average 8–10 m<sup>3</sup> per hectare per year on a 25-year cycle. There is a ready demand for teak timber, both in domestic and export markets. The 2000 Forest Plantation Development Fund Act (and its amendment in 2002) provides financial assistance for the development of private commercial forest plantations. In 2002, the government embarked on a large reforestation program to be implemented by farmers. The FC provides improved planting material and monitors the program. Tree plantations under agroforestry/*taungya* systems are of great importance in Ghana, and off-reserve trees contribute considerably to timber production.

**Forest certification.** Ghana has been in the process of establishing a forest-management certification system since 1996, when a National Committee on Forest Certification (NCFC) was established. The Ghana Forest Management Certification System Project was initiated in 1997 with the assistance of the EU and the Netherlands to develop draft standards for certification. Field tests on the resulting chain-of-custody and log-tracking systems have been carried out since 2002, as has the development of standards for sustainably managed forests. The concessions of one company, Samartex Timber and Plywood Ltd, amounting to 110,000 hectares in the natural forest production PFE, were certified in 2003 by SGS for compliance with Ghanaian logging and chain-of-custody standards.

**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	
1,150	1,035	1,150	0*	270 <sup>c</sup>	97	97	0

\* The certification of Samartex Timber and Plywood Ltd by SGS is not counted here since it is not under the umbrella of a formal certification scheme. The company has committed itself to achieving FSC certification by 2007

In February 2005, Samartex signed an agreement with WWF and Friends of the Earth to become the first participant of the Ghana Forest and Trade Network and commit to achieving FSC certification by 2007 (WWF 2005).

**Estimate of the area of forest sustainably managed for production.** The area under concessions/TUCs within the PFE is about 1.035 million hectares, divided into 52 FMUs consisting of 719,300 hectares of forest reserves and 315,200 hectares outside reserves. The estimated area of forest under SFM is considered to cover at least 270,000 hectares<sup>c</sup>, including the Samartex operation.

**Timber production and trade.** Total roundwood production in 2003 was 22.1 million m<sup>3</sup>, of which 93% was fuelwood (FAO 2005b). Official production of industrial roundwood in 2003 was 1.4 million m<sup>3</sup>, 27% more than in 1999 (1.10 million m<sup>3</sup>) (ITTO 2004, 2005). Wood-processing consists of sawmilling and the manufacture of wood-based panels (plywood and veneer), with a small secondary-processing industry. Sawnwood production was 496,000 m<sup>3</sup> in 2003, compared to 454,000 m<sup>3</sup> in 1999 (ibid.); 405,000 m<sup>3</sup> of wood-based panel products were produced in 2003 compared to 225,000 m<sup>3</sup> in 1999. The timber industry is Ghana's fourth-largest foreign-exchange earner: the export value of primary wood products amounted to an estimated US\$169 million in 2003, comprising sawnwood (US\$84.9 million), veneer (US\$59.5 million) and plywood (US\$24.5 million) (ITTO 2005). The export of round logs has been effectively banned since 1997 and levies imposed on exports of air-dried timber of nine important species. Half of all teak production is exported in sawn form, mainly to India, although Ghana's main export market remains Europe.

**Non-wood forest products.** Wild meat, wild fruits and tubers, honey, oils, construction materials and medicinal plants are some common NWFPs. The wild-meat sector includes 300,000 hunters at the local community level who produce between 220,000 to 380,000 tonnes of wild meat annually, mainly from forests, valued at between US\$210 million and US\$350 million, for domestic consumption<sup>c</sup>. International marketing efforts are being directed to at least two Ghanaian NWFPs: thaumatin, a sweetener from seeds of *Thaumatococcus danielli*, and novella, an oil/margarine from seeds of *Allan-blackia parviflora*. The contribution of the forestry sector to tourism promotion has not been quantified, although it is believed to be quite significant.

### Forest for protection

**Soil and water.** The area of forests managed primarily for the protection of soil and water was not reported<sup>a</sup> or otherwise available.

**Biological diversity.** Of Ghana's estimated 1,844 forest-dependent trees, mammals, birds and amphibians, 69 are considered endangered<sup>a</sup>. Seventeen mammals, nine birds, four reptiles, ten amphibians and 117 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 13 mammals, six birds, ten amphibians and nine plants are found in forests (IUCN 2004). One plant species is listed in CITES Appendix I and 29 in Appendix II (CITES 2005). Ghana has recently formulated a national biodiversity strategy which seeks to ensure the development and implementation of a well-coordinated biodiversity conservation policy<sup>a</sup>.

**Protective measures in production forests.** Environmental provisions in the TUCs and guidelines have been set to maintain representative or special parts of each production forest as undisturbed.

**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
353	174	n.d.	n.d.	108 <sup>c</sup>

An area of about 465,000 hectares of production forest has been demarcated for catchment values, of which over 100,000 hectares are considered environmentally sensitive<sup>a</sup>.

**Extent of protected areas.** The estimated area of protection PFE is 353,000 hectares. The FC reports 31 protected areas of IUCN categories I-II covering a total area of 1.11 million hectares, of which 1.06 million hectares are grass savanna. According to UNEP-WCMC (2004), 174,000 hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV; the majority of this area (135,000 hectares) is unclassified as to forest type.

**Estimate of the area of forest sustainably managed for protection.** Table 4 shows the estimated area of protection PFE managed sustainably based on information provided at a recent workshop on the ITTO C&I .

### Socioeconomic aspects

**Economic aspects.** Forests accounted for 2.3% of GDP in 1999<sup>a</sup> and about 10% of export earnings. The formal sector employed about 104,000 people in 1999<sup>a</sup>. Many more people (including illegal chainsaw operators, NWFP harvesters, etc) make at least some of their income from forests (see below).

**Livelihood values.** An estimated 2 million people depend on forests for subsistence uses and traditional and customary lifestyles<sup>a</sup>. Major activities in which forest-adjacent communities are involved include wild-meat production, fuelwood and charcoal production, wood-carving and canoe-carving, rattan production, chewstick-gathering, chainsaw lumber production (an illegal activity), and hunting (often also illegal)<sup>a</sup>. Alternative livelihood strategies are being tested as part of Ghana's poverty reduction strategy<sup>a</sup>.

**Social relations.** The constitution provides for the sharing of royalties between government and traditional owners as follows: 40% to stools and 60%

to the state in reserve forests and 60% to stools and 40% to the government in off-reserve forests. Social-responsibility agreements are reached between TUC-holders and the communities where timber extraction takes place for the provision of agreed social services and amenities. Donor-assisted projects are also supporting community participation in forestry; for example, an ITTO project on participatory tropical forest development by women in indigenous communities has been ongoing since 1999. The FC will gradually divest itself of responsibility for the forest resources in the North Savanna Zone and hand it over to the local communities.

Eight forest sites covering 21,500 hectares have been set apart for research and education and 21 sites covering 1.12 million hectares for recreation<sup>a</sup>.

### Summary

Ghana has favourable conditions for the achievement of SFM, such as impressive human resources – including a strong Forestry Commission – and a long history of forest management. Nevertheless, many challenges must be met. For example, fire plays an influential and – in some forests – destructive ecological role and is difficult to control. Some forest reserves are well-managed, but others may have been over-harvested and off-reserve forests are often unregulated. Moreover, illegal activities such as chainsaw lumber production and poaching are thought to be widespread.

### Key points

- The area of PFE is an estimated 1.60 million hectares, comprising 1.15 million hectares of natural-forest production PFE, 353,000 hectares of protection PFE and 97,000 hectares of plantations.
- At least 270,000 hectares of natural-forest production PFE are considered to be managed sustainably; an estimated 108,000 hectares of protection PFE are so managed.

- The silvicultural system used in natural forests is a polycyclic selection felling system using a cutting cycle of 40 years; a national AAC has been set at 500,000 m<sup>3</sup>.
- There are manuals for production, management and planning, which set out the obligations of logging contractors.
- Ghana is establishing a sizeable plantation estate of teak.
- Community participation in forestry is being facilitated through community forest committees (CFCs) and a collaborative forest management unit of the Forestry Commission; in 2003 there were some 100 CFCs.
- An estimated 2 million people depend on forests for subsistence uses and traditional and customary lifestyles.
- Ghana has introduced a new timber utilization contract system to improve efficiency, transparency and accountability in forestry, particularly in forest production activities.
- There is limited information about the condition of protected areas.

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# LIBERIA



\*For legend see page 58

## Forest resources

Liberia has a land area of 11.1 million hectares and a population of 3.3 million people. It is bounded by Sierra Leone to the west, Côte d'Ivoire to the east, Guinea to the north and the Atlantic Ocean to the south. The country can be divided into three physiographic regions: (i) the hilly coastal region; (ii) a central plateau ranging from 200 to 250 m with table mountains up to 600 m; and (iii) highlands reaching 1,380 m in the north and northeast. According to a report issued by the Forest Resource Mapping Survey of Liberia (1985), about 50% of the land area, or some 5.5 million hectares, was forest in the mid 1980s, of which about 3.88 million hectares were productive. FAO (2005a) estimated the total forest area at 3.48 million hectares; a recent ITTO diagnostic mission to Liberia reported data compiled by a World Bank-funded study (Bayol & Chevalier 2004), which

estimated that there were about 3.4 million hectares of relatively intact forest and about 2.26 million hectares of poorer forest cover, comprising 1 million hectares of forest land that had been subject to agricultural pressure and another 1.3 million hectares that had been seriously affected by agricultural pressure and contained only islands and patches of forest<sup>b</sup>. The intact forest comprised two main blocks: a south-eastern block of very wet evergreen forest and a drier, Upper-Guinean moist evergreen and semi-deciduous forest in the northwest<sup>b</sup>.

**Forest types.** Characteristic species of the moist evergreen forests are *Lophira alata*, *Heritiera utilis* and *Sacoglottis gabonensis*, while Meliaceae (one of the most important timber families in West Africa) is represented by only two species: *Lovoa trichilioides* and *Guarea cedrata* (bossé). The semi-deciduous forests cover the northern half of the country and contain a higher representation of Meliaceae, the characteristic species being *Nesogordonia papaverifera* (danta) and *Aningeria robusta*. Common shade-intolerant species are *Albizia* spp, *Fagara* spp, *Terminalia* spp and *Pycnanthus angolensis*.

**Dynamics of forest resource change.** The rapid destruction of Liberia's forest resources has been caused by over-harvesting and uncontrolled logging, accelerated by civil war. In addition, shifting cultivators have accessed logged forests using the many logging roads built since the early 1960s. There has been widespread shifting cultivation, mainly for growing upland rice. Between 1990 and 2000, Liberia lost about 760,000 hectares of forest, a deforestation rate of about 2% annually (FAO 2005a). As noted above, about 2.3 million hectares of the forest estate is affected by agriculture, including 1 million hectares that has been greatly fragmented.

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>d</sup>			Total
		Production		Protection	
		Natural	Planted		
3.48-5.66	4,124	1,310	n.d.	101	1,411

**Permanent forest estate.** Liberia's forests are categorized as: natural forests, for granting on lease to concession-holders through forest product utilization contracts; optional forests, which have special arrangements to allow for the removal of timber before diverting them to other non-forest uses; and parks and protected areas for environmental conservation. Based on the limited information available on areas allocated to concessions, the area designated as PFE is estimated at 1.41 million hectares (Table 1); this is likely to be expanded in the near future. In general, surveys to demarcate the PFE are inadequate, as is surveillance to safeguard its integrity.

**Planted forests.** According to FAO (2001), there were 9,000 hectares of timber plantations in Liberia in 2000, with an annual planting rate of 100 hectares per year. They comprised about 2,000 hectares of teak, 2,000 hectares of pines and 5,000 hectares of other broadleaved species. However, these plantations are likely to have been heavily degraded or destroyed; the ITTO diagnostic mission reported an insignificant plantation estate apart from some important rubber estates "which are generally in a poor condition"<sup>b</sup>. There are some coconut plantations and small areas of oil palm.

## Institutional arrangements

**Forest tenure.** According to the 2000 National Forest Law, all forest resources belong to the government except for communal and privately owned forests. Communal land is designated for the exclusive use of local communities for purposes other than logging. Customary rights over such land are not automatically recognized; they must have been previously documented. The only private forest resources are those that have been developed through artificial regeneration on privately owned land. The ITTO diagnostic mission reported that the traditional land and resource rights of the majority rural population have been systematically ignored and undermined by a small elite throughout Liberia's 150-year history. Nevertheless, the Liberian constitution and specific laws, such as the National Environmental Protection Act of 2002, note the rights of rural people. There is mention of "tribal forests", "community forests" and similar terms. The mission also reported strong support across

a range of stakeholders for community-based forest management and greater benefit-sharing with rural people<sup>b</sup>.

**SFM policy framework.** The 2000 National Forest Law has provisions on sustainable management and the utilization of forest resources (Section 8.2). The Forestry Development Authority (FDA) has produced a document entitled *Forest Policy Review: Towards Vision 2024*. This incorporates, among other things, the ITTO Objective 2000.

**Forest policy and legislation.** The forest code of 1953 was amended in 2000 and has been in force since 2002. The amended National Forest Law is intended to promote SFM as a basis for national reconstruction. Legislation was also planned to encourage the active involvement of NGOs in reforestation with the direct participation of forest dwellers, and to increase incentives for concession-holders. The Commission on Environment was set up in 2000 with powers to prepare guidelines and formulate policies for agencies concerned with nature conservation and the environment, but these powers could not be effectively exercised due to the civil crisis. The stability and sustainability of the logging sector has been threatened by procedural flaws such as exception/exemption procedures for inappropriate forestry activities, the granting of special favours, and forest crimes including timber theft, corruption and illegal logging<sup>b</sup>. Indeed, log exports were known to be used as a source of funding for private militias, thereby prolonging the civil war. As a result of international concern over this issue, the UN Security Council passed its resolution 1478 calling on all member states to ban imports of round logs and timber products from Liberia for ten months from July 2003. The import ban was subsequently extended and remained in place as of December 2005.

**Institutions involved in forests.** An Act of Parliament of 1976 established the FDA as the body responsible for forestry in Liberia and also recognized the importance of forests as a key renewable natural resource. Amendments to this act in 1988, 2000 and 2003 sought to strengthen the FDA's ability to manage and protect forests. The FDA is the agent through which policy is implemented, including forest management plans. However, the FDA is seriously under-resourced;

it lost many staff to the civil war and, for those remaining, salaries are extremely low and often paid several months late<sup>b</sup>. The weakness of the FDA has greatly limited progress in initiatives to rebuild the forest sector.

A workshop on reforming the forest sector was organized in Monrovia by the US Embassy in December 2003 involving forestry officials, logging companies, donors and NGOs. The workshop suggested that the Security Council should only lift its sanctions once: (i) UN peacekeepers had deployed forces in forest areas to ensure they were safely under control; (ii) the government had ensured that timber taxes could be accounted for; and (iii) the FDA had been reformed and strengthened (Blundell 2003). A donors' meeting took place in mid 2004, with substantial amounts of money pledged to revive the forest sector and reshape the forest administration after the civil war; however, to date, few of these projects have commenced. An informal alliance called the Liberia Forest Initiative has been formed by a number of actors including the US government, the World Bank, IUCN, Conservation International and several local NGOs such as Green Advocate.

## Status of forest management

### Forest for production

Because of increasing demand and in order to promote lesser-used species in the international market, the government has promulgated a regulation which re-categorized eleven 'future obligatory species' as 'current obligatory species'. There are also regulations to ensure the effective monitoring and supervision of the extraction, processing and export of timber and timber products. Salvage permits to concessionaires are to be abolished. The growing stock of commercial timber is estimated to be about 81.4 million m<sup>3</sup>. The timber harvest is supposed to be based on AAC calculations and guided by the ATO/ITTO PCI, but these principles are not adequately applied in practice.

Timber is harvested entirely by private companies through forest resources utilization agreements (FRUAs) entered into with the government, or through operation permits. In the late 1990s, more than

30 companies held logging concessions covering 40% of the national territory; the OTC (Oriental Timber Corporation) alone was logging some 1.6 million hectares both within the PFE and outside it. Some concessions were known to be illegal. The FDA has recently attempted to review these and decide which were legitimate, a difficult task since many files were lost or destroyed during the war<sup>b</sup>. Bayol and Chevalier (2004) reported that there were 42 existing forest concessions covering a total of 5.95 million hectares (probably including non-forested areas); there was significant overlap between concessions and proposed protected areas. It was recommended that 18 of these concessions covering 1.82 million hectares be cancelled, 13 (2.43 million hectares) be further assessed, and eleven (1.7 million hectares) be allowed to resume logging<sup>b</sup>.

The 2000 National Forest Law requires individuals or companies holding FRUAs to conduct surveys and submit comprehensive work plans to the FDA. FRUA holders also have to file a performance bond with the government issued by a reputable local commercial bank or financial institution. FRUAs have been divided into three categories based on forest size: Class A, with a minimum size of 809,000 hectares; Class B, with a minimum size of 405,000 hectares; and Class C, with a minimum size of 121,000 hectares. All agreements are valid for 25 years. A holder of a Class A agreement is required to develop a large-scale integrated wood-processing mill, for Class B a medium-sized processing mill, and for Class C a small-scale processing unit. All holders of these rights must undertake periodic environmental impact assessments of their operations and engage in community development projects. As of September 2001, 28 registered timber concessions (of which 17 were held by expatriate companies) were active in the production and export of roundwood. Global Witness (2003) reported that, by early 2003, the number of active companies had been consolidated into 14 concessions. As in Liberia as a whole, there is a serious shortage of skilled labour in the forest sector<sup>b</sup>.

**Silviculture and species selection.** The Liberian Selective Logging System involves selective harvesting with no silvicultural treatments apart from assuring good natural regeneration of the

**Table 2 Some commonly harvested species for industrial roundwood**

Timber species	Remarks
<i>Lophira alata</i> (ekki)	Largest quantity harvested, regenerates well in forests
<i>Ceiba pentandra</i> (ghe)	From open areas, for veneer and plywood
<i>Hallea ciliata</i> (abura)	Syn. <i>Mitragyna ledermanni</i> ; general-purpose timber, from swampy areas
<i>Entandrophragma candollei</i> (kosipo)	Used for flooring and furniture making, difficult to regenerate
<i>Gilbertiodendron preussii</i> (limbali)	Used for heavy carpentry and shipbuilding, etc, difficult to regenerate

stand. The lack of any silvicultural treatments is due both to their cost and the lack of silvicultural research and know-how (Liberia has no forest research institute). FRUAs and harvest regulations prescribe operations before, during and after harvesting. The main harvest controls are girth limits and a 25-year felling cycle; the latter is short compared to those in other tropical forest regions and has been imposed mainly due to economic considerations. It is uncertain how effective harvest controls have been and how the present logging regime affects the forest. The percentage of commercial timber species varies throughout the country. Fifteen years ago, sipo and *Tarrietia utilis* (niangon) were the species with the largest export volume, but the species listed in Table 2 and others like *Tetraberlinia tubmaniana* (tetra) are more important today, both in volume and value.

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

Planted forests currently play an insignificant role in Liberia.

**Forest certification.** No Liberian forests are currently certified and there has been no move to develop policies in this direction.

**Estimate of the area of forest sustainably managed for production.** None of the production PFE is currently under management plans, and no forest can therefore be considered to be managed sustainably (see Table 3).

**Timber production and trade.** Liberian statistical information on timber production and trade is highly unreliable. For example, while FAO (2003) estimated a total industrial roundwood production

of 337,000 m<sup>3</sup> in 2001, ITTO (2005) estimated the volume of log exports that year based on trading-partner reports to be 940,000 m<sup>3</sup>.

No international statistical reports have been forthcoming from Liberia for several years due to the civil war and subsequent sanctions. During the civil war, some concessionaires took advantage of the armed conflicts to illegally increase production, while others curtailed their activities considerably. According to FAO (2005b), total roundwood production in 2003 was close to 5.9 million m<sup>3</sup>, almost 95% of which was fuelwood.

With the UN sanctions on timber trade in force, forest production has declined; total industrial roundwood production was an estimated 800,000 m<sup>3</sup> in 2003 compared to 1.36 million m<sup>3</sup> in 2002 (ITTO 2005). Foreign direct investment in the timber sector, which stood at US\$27 million in 1999, fell to an estimated US\$2.8 million by the end of 2002. Prior to the war, wood processing was confined to sawmilling and very limited manufacture of wood-based panels, but most mills have been destroyed or seriously damaged. A small volume of sawnwood was exported prior to the sanctions. The estimated earnings from the export of wood and wood products in 2002 were US\$325 million, falling to almost nil in recent years.

**Non-wood forest products.** Fruits, roots, mushrooms, leaves, honey, snails and wild meat are all harvested from forests and used as food by local communities. Wild meat is probably the main source of protein for rural people; some also enters the domestic market. Ntiamoa-Baidu (1997) estimated that wild meat contributed up to 90% of

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

Total	Natural			Planted		
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified
1,310	1,310	0	0	0	n.d.	0

total protein consumption in the country. The most commonly hunted species are antelopes and monkeys. Gums, resins, medicinal plants and cola nuts (*Cola* spp) are also marketed locally and serve as sources of income.

### Forests for protection

**Soil and water.** No areas have been designated as primarily for soil and water conservation.

**Biological diversity.** Liberia's forests are of great significance for biodiversity. In 1999, the West African Conservation Priority-setting Exercise funded by the GEF identified the Upper Guinean Ecosystem, of which the most intact remaining examples are found in Liberia, as the top conservation priority in West Africa<sup>b</sup>. The forests are home to at least 2,900 flowering plants, 240 timber species, 150 mammals (including the western chimpanzee, the pygmy hippopotamus and forest elephant), 620 birds and 125 reptiles and amphibians<sup>b</sup>. Twenty-one mammals, eleven birds, three reptiles, five amphibians and 46 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 17 mammals, ten birds, four amphibians and three plants are found in forests (IUCN 2004). Two plants are listed in CITES Appendix II (CITES 2005).

**Protective measures in production forests.** Limited protective prescriptions are included in the FRUAs and forestry regulations, but the extent of their implementation is uncertain.

**Extent of protected areas.** There are two biological reserves in Liberia: Sapo National Park (162,000 hectares) in the southeast and the Nimba Nature Reserve (13,600 hectares); neither is under effective management<sup>b</sup>. Several new protected areas have been proposed based on recommendations by Flora

& Fauna International and Conservation International<sup>b</sup>. According to UNEP-WCMC (2004), 100,500 hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV, including 87,000 hectares of lowland evergreen broad-leaved rainforest.

**Estimate of the area of forest sustainably managed for protection.** No protection PFE is considered to be under SFM at present (Table 4).

### Socioeconomic aspects

**Economic aspects.** In the past, forestry ranked first in foreign exchange earnings and in its contribution to GDP; in 2002, the reported contributions of forestry and logging to GDP and foreign exchange were 26% and 65% respectively<sup>b</sup>. The inconsistency of information on almost all aspects of forestry is a particular problem in Liberia. In 2000, for example, the FDA reported the value of logs exported as US\$79.9 million, the Central Bank of the Government of Liberia as US\$60.3 million, and the Global Trade Atlas as US\$103.7 million, while the UN estimated it to be US\$146 million. ITTO (2003), basing its estimate on imports reported by trading partners, reported a figure of over US\$200 million, more than triple the Central Bank figure. There are similar discrepancies in reports of the number employed by the forestry sector, which, for 2000, ranged from 5,000 to 20,000, and was reported to be 7,000 in 2002<sup>b</sup>. What is not in doubt is that all of these numbers are now significantly smaller.

**Livelihood values.** With around half of Liberia's 3.3 million people living in or near forested areas, livelihood and cultural values of forests are significant. Rural communities have become increasingly dependent on forests for subsistence during the recent turmoil. In many rural areas, forests are the only source of food and are crucial to the

**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
101	101	0	0	0

survival of many. Thousands of people make their living from the provision of charcoal and fuelwood to urban centres<sup>b</sup>.

**Social relations.** The civil war disrupted the traditional livelihoods of forest-dwelling communities. It contributed to deplorable and dangerous working conditions for timber workers, with serious human rights abuses reported in logging camps (Global Witness 2003). Illegal commercial hunting is widespread.

The sanctions imposed by the UN Security Council in 2003 have resulted in severe restrictions on the timber industry and the primary and secondary employment provided by logging and wood processing has subsequently dwindled. The support provided by logging companies for the running of schools, medical health posts, community facilities and the provision of infrastructure has likewise declined.

According to an ITTO mission, forest policy and even post-war reform efforts have over-emphasized the commercial timber sector and given little attention to resource tenure and issues of high relevance to the poor, such as wild-meat and fuelwood production<sup>b</sup>.

## Summary

Liberia is blessed with a rich forest resource, a substantial part of which, however, has been lost or degraded in recent years during civil war. Once the country emerges from its political problems, a newly reconstituted and restructured forest sector, built on the pillars of accountability and transparency, could play a major role in economic growth and sustainable development. But its success will depend very much on strong political will and international support.

## Key points

- Liberia's PFE covers an estimated 1.41 million hectares, comprising 1.31 million hectares of natural-forest production PFE and 101,000

hectares of protection PFE. More forest could be committed to the PFE from the presently uncommitted area of about 2 million hectares.

- None of the PFE is currently thought to be under SFM.
- The existing protection PFE comprises less than 3% of the country's forests.
- The UN Security Council imposed an embargo on the export of timber from Liberia in 2003 and it remains in force. The embargo was designed to minimize the extent to which revenues from timber exports contributed to private militias.
- In the past, the Liberian forestry sector has generated up to a quarter or more of GDP, but this has declined due to the embargo and the general disarray of the sector.
- There are few or no reliable inventory data available to facilitate forest management.
- The Forest Development Authority (FDA) is responsible for overseeing the forestry sector, but it is seriously under-resourced.
- The FDA has recently attempted to review concession agreements and decide which are legitimate, a difficult task since many files were lost or destroyed during the civil war.
- There is strong support across a range of stakeholders for community-based forest management and greater benefit-sharing with rural people.
- No silvicultural system has been devised for Liberian forests other than a selective logging regime. The prescribed felling cycle of 25 years is relatively short.
- Much of the timber-processing capacity and other infrastructure was destroyed during the civil war and is yet to be rebuilt.

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# NIGERIA



\* For legend see page 58

## Forest resources

Nigeria has a land area of 92.4 million hectares and a population of about 134 million people, making it Africa's most populous country. It is bordered by Benin to the west, Niger to the north, Cameroon to the east and the Atlantic Ocean to the south. The climate is humid in the south and hotter and drier towards the north. A large proportion of the country sits on a plateau, which is divided into several parts by the Niger River and its tributaries. Mountains reaching more than 2,000 m occur in the border area with Cameroon. There are two major vegetation zones: the forest zone, which occurs in

a belt 50 to 250 km wide adjacent to the Atlantic coast; and the savanna zone to the north, which can be divided into the wetter Guinea zone and the drier Sudan zone. Estimates of forest cover range from 9.7 million hectares<sup>c</sup> to 13.5 million hectares (FAO 2005a)<sup>1</sup>.

**Forest types.** About 70% of the natural forest is open tree savanna, with the remaining 30% closed forest. The closed forest includes mangrove and coastal forest (22%), fresh water swamp (38%) and lowland wet forest (40%). The latter type (also called 'high forest') is divided into lowland rainforest in the south and mixed deciduous forest to the north. These forest types, although heavily degraded, are the main remaining sources of hardwood timber but cover only about 2% of the total land area. Meliaceae and Leguminosae species such as *Khaya ivorensis* (Lagos mahogany), *Entandrophragma* spp, *Lovoa trichilioides* (cedar) and *Gosweilerodendron balsamiferum* (agba) are characteristic of the rainforest area, whereas Sterculiaceae, Ulmaceae and Moraceae species such as *Nesogordonia papaverifera* (otutu), *Triplochiton scleroxylon* (obeche), *Celtis* spp and *Chlorophora excelsa* (iroko) characterize semi-deciduous forests. Riparian forests are the only closed forest in the savanna zone, characterized by species such as *Mitragyna ciliata* and *Uapaca* spp. Most of Nigeria's forests are so heavily degraded that in some areas secondary forest succession is impeded. *Elaeis guineensis* (oil palm) regenerates naturally in many degraded areas of the high-forest zone. Important secondary

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares)*			
		Production		Protection	Total
		Natural	Planted		
9.7-13.5	4,456	2,720 <sup>d</sup>	375	1,010	4,105

\* An estimated 2.7 million hectares of heavily degraded forest outside the forest reserves (so-called free areas) are also used for timber production (Okonofua 2005) but are not included here in the PFE

<sup>1</sup> Much of the information contained in this profile has been obtained from secondary sources (most notably FAO's 2003 country report for its African Forest Sector Outlook Study), supplemented by discussions with participants at an ITTO C&I workshop held in December 2005.



forest species in degraded forest and in unmanaged rubber and *Gmelina* plantations are *Trema guineensis*, *Pentaclethra macrophylla*, *Musanga cecropioides* and *Anthocleista* spp.

**Dynamics of forest resource change.** Forest area declined during the 1990s at an estimated annual rate of 2.6% (or 398,000 hectares per year) (FAO 2005a), caused by agricultural expansion, encroachment, over-harvesting, bush burning, illegal harvesting and de-reservations. The Federal Department of Forestry (FDF 2001) suggested that the annual depletion rate to be as high as 3.5%. A detailed analysis of the land-use dynamics of Nigeria shows that even forests contributing to flood-plain agriculture (fadama) and water resources development will eventually be depleted, with potentially catastrophic consequences. The FDF (ibid.) noted that the forest estate of Nigeria is highly depleted and that the Sahara Desert is encroaching southward at a rate of about one kilometre per year. Forest fires are common and caused by deliberate burning. It was estimated that only about 975,000 hectares of forest reserves are productive, while another 2.34 million hectares of free (non-reserve) areas are only partially productive.

**Permanent forest estate.** In the 1960s, the government set aside an area of 9.7 million hectares, about 10% of the country, as forest reserves. These are distributed over some 445 sites, 75% of which are in the savanna and 25% in the high forest. Since many of these forest reserves have been badly depleted of commercial and other timber species, not all can be included in the estimate of production PFE given in Table 1, which includes all FMUs allocated primarily for timber production. More than 60% of the initial forest reserve area had been lost by 2000, due to agricultural encroachment, illegal logging, planned agricultural development and urbanization<sup>c</sup>. The estimate of protection PFE in Table 1 is taken from UNEP-WCMC (2004).

**Planted forests.** The estimated planted forest area of 375,000 hectares in 2000 (FAO 2001) was thought to comprise at least 110,000 hectares of *Gmelina arborea* and an area of about 160,000 hectares of different hardwood species, including 74,000 hectares of teak in forest reserves and in private plantations, an unknown area of other planted hardwood species such as

*Terminalia ivorensis*, *Nauclea diderrichii*, *Triplochiton sceroxylon*, acacias and eucalypts, and about 10,000 hectares of various pines (Okonofua 2005). There were also about 318,000 hectares of *Hevea* (rubber) plantations (FAO 2001), managed as an agricultural crop but used for both rubber and timber production. The annual planting rate in the recent past has been about 23,000 hectares, but there is a general belief that most of the planted area remains low in stock<sup>c</sup>; a National Forestry Development Program designed to encourage community plantation development was extended to 2007 after failing to meet its four-year target in 2003.

## Institutional arrangements

**Forest tenure.** In principle, local people own the forests; the management and control of forest reserves, which cover around three-quarters of the forest area, is vested in the state governments<sup>c</sup>. However, dual ownership of natural forests by local and state governments still exists in some of the 17 northern states<sup>c</sup>. Local governments are responsible for communal forest areas; state governments for forest reserves, game reserves and sanctuaries; and the federal government for national parks. A total of 16 states (Abia, Akwa Ibom, Anambra, Cross River, Delta, Edo, Enugu, Ebonyi, Imo, Lagos, Ogun, Ondo, Ekiti, Osun, River and Bayelsa) contain high forests and have special forest laws to administer their tenure<sup>c</sup>.

**SFM policy framework.** Nigeria is a member of the ATO and, since 2001, ITTO. The C&I frameworks of these two organizations are therefore available for uptake in Nigeria and initial discussions were held in December 2005 to develop such a framework<sup>c</sup>.

**Forest policy and legislation.** Nigeria has had forestry and natural-resource conservation laws since the first half of the 20th century. The first Forestry Act was enacted in 1937, which established a forest reserve system under the state governments. The government established a more comprehensive forest law in 1956, the Law for the Preservation and Control of Forests in Eastern Nigeria. It gives the designated minister responsibility for the protection, control and management of forest reserves and protected areas; at the same time it gives the minister the power to de-reserve forests (ie re-classify them for other uses). Some

states have enacted specific regulations to monitor and control the reserves, but the continuing high rate of deforestation suggests that overall control has not been effective.

Nigeria's National Agricultural Policy, adopted in 1988, sets forth the national policy on forest management and the sustainable use of forest resources. The goal is to achieve self-sufficiency in all aspects of forest production. Major goals are the expansion of the forest estate and its management for sustained yield, the promotion of forest regeneration at rates higher than harvesting, the protection of forest resources from fire and grazing, and the development of forest industry. To achieve these objectives, it aims to expand the forest estate from 10% to 20%. Nevertheless, de-reservation and deforestation have expanded over the past 15 years<sup>c</sup>. As of the end of 2005, Nigeria has started a process of national hearings for a new national forest policy and a new national forest act<sup>c</sup>. The draft policy includes provisions to increase the total area under SFM to 25% of the nation's land area; to develop principles, criteria and indicators for the sustainable management of forest resources; and to improve environmental services of forests for social and economic benefits<sup>c</sup>.

**Institutions involved in forests.** The forestry sector is administered at the federal, state and local government levels; responsibilities, authority and resources are shared among these according to the 1999 constitution of Nigeria, which gives shared control over the development of natural resources to the local governments and the states. However, there is a lack of clarity in the respective mandates of these bodies (there are 36 state forestry departments – some of the states even have ministries of forests<sup>c</sup> – and 774 local councils), which leads to inefficiencies. The FDF, created in 1970, is currently under the Ministry of Environment; it has no authority over forest management and is mainly responsible for international treaties and for providing policy guidelines to the forestry authorities of the states<sup>c</sup>. The National Forestry Development Committee (NFDC) is the body responsible for formulating national forest policy and technical guidelines on forest management<sup>c</sup>. In order to facilitate field operations the FDF fosters forestry and environmental development through six divisions: Forestry Management, Forest Resource Survey,

Forest Resources Utilization, Agroforestry, Support Services and Extension and Environmental Conservation. At the federal level, the Forestry Research Institute of Nigeria (FRIN) has the mandate for research and education on forestry and the utilization of forest products. Forest-sector development has been hindered by a lack of funds and frequent policy changes, despite (or perhaps partly because of) the extensive bureaucracy involved in overseeing the sector.

Several NGOs provide inputs to the management of forestry resources. Notable among these are the Nigerian Conservation Foundation, the Nigerian Environmental Study and Action Team, Savannah Conservation Nigeria, the Forestry Association of Nigeria and local initiatives such as the Ekuri Initiative in Cross River State. However, their influence on forest management, particularly in forest reserves, remains small<sup>c</sup>.

## Status of forest management

### Forest for production

While many forest reserves were intensively managed in the past for timber production, a significant number have also been almost completely deforested while retaining the designation, leading to the apparent contradiction of non-forested forest reserves.

Timber concessions are awarded by state governments, which receive all timber royalties. In theory, a proportion of forest revenues should go to the local communal landowners and traditional institutions; in practice, however, the funds often get diverted<sup>c</sup>. For this reason, local communities have little incentive to prevent illegal logging and often collude with illegal loggers because they derive greater benefits that way. According to Sanwo (2005), 70% of the total timber extracted in high-forest states in Nigeria is stolen, with no records kept. The state forestry departments have been unable to protect the forest estate adequately from extensive encroachment. Harvesting of industrial wood is done by mill operators, by independent registered loggers and, in many cases, by poachers<sup>c</sup>. In the past, some operators were awarded five- to 20-year concessions by states, but this has recently been reduced to one to three years in most states to

**Table 2 Some commonly harvested species for industrial roundwood<sup>c</sup>**

Timber species	Remarks
<i>Mansonia altissima</i> (ofun)	Used in sawmilling and veneer production
<i>Tectona grandis</i> (teak)	Valuable plantation species
<i>Terminalia superba</i> (afara)	Commercial species used as sawnwood
<i>Entandrophragma candollei</i> (omu)	All-purpose commercial species
<i>Triplochiton scleroxylon</i> (obeche)	Now the major harvested species for all purposes

improve control<sup>c</sup>. As of December 2005 Nigeria has defined a total of 1,160 FMUs (both within and outside the reserve system), of which 154 currently are producing timber<sup>c</sup>. The total area under forest production is estimated to be 1.06 million hectares (Okonofua 2005).

**Silviculture and species selection.** Initially, the forest resources in the high-forest zone were managed for timber production on a felling cycle of 100 years, with a specified minimum diameter limit for the different species of between 60 and 90 cm (FDF 1996). Forests in the southern and south-central regions were sub-divided into numbered mile-square compartments managed on the basis of working plans prepared by the FDF. In response to harvesting pressures, the felling cycle for natural forests was reduced to 50 years and has since been further lowered. Natural regeneration of the harvested forests was stimulated by the Tropical Shelterwood System (TSS). By the mid 1960s, a total area of 200,000 hectares in the western region of Nigeria was managed under the TSS system (Okonofua 2005). Owing to the low growth rates of the natural forest, the TSS was abandoned in the early 1970s in favour of artificial regeneration under the *taungya* system. The early *taungya* plantations led to subsequent major plantation schemes in the high-forest zone.

More than 300 tree species have been identified as possible timber species; about 40 species are harvested today. In addition to the five species listed in Table 2 and *Gmelina arborea* from planted forests, *Entandrophragma cylindricum* (sapele), *Gossweilerodendron balsamiferum* (agba), *Chlorophora excelsa* (iroko), *Terminalia ivorensis* (edo), *Brachystegia* spp and *Lophira alata* (ekki) are the main species harvested for timber.

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

Despite its long forestry history, the large-scale development of planted forests has been recent in Nigeria. By the end of the 1960s, the management of forest reserves in the high-forest zone was assessed by the government and the World Bank to be economically unviable, and many natural stands have been converted to plantation projects, in particular with *Gmelina arborea*<sup>c</sup>. Many other forest reserves, particularly in the Guinea savanna, have also been converted to planted forests of exotic (acacias and eucalypts) and indigenous species. Many of the planted forest areas are harvested today; nevertheless, few of them are adequately managed for long-term production<sup>c</sup>. Trees outside the forest are mainly relics of the pre-existing forest cover, sacred forests, forest patches established by local villagers and home gardens.

**Forest certification.** The creation of a national working group on forest and timber certification has been proposed and discussed for a few years without result<sup>c</sup>. No Nigerian forest has so far been certified.

**Estimate of the area of forest sustainably managed for production.** The lack of detailed information makes it difficult to assess the quality of forest management. Around 1.06 million hectares of forest reserves were allocated in mid 2005 to concessions and licences (Okonofua 2005). About 650,000 hectares of forest reserves are reported to be covered by management plans, including planted forests<sup>c</sup>. No estimate of the area under SFM was possible (Table 3)<sup>c</sup>.

**Timber production and trade.** The estimated total roundwood production in 2003 was 69.9 million m<sup>3</sup>, of which 60.4 million m<sup>3</sup> (86%) was for fuelwood

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

Total	Natural			Planted			
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified	
2,720	1,060	650	0	n.d. <sup>c</sup>	375	175	0

(FAO 2005b). Nigeria's total production of industrial roundwood was an estimated 7.10 million m<sup>3</sup> in 2003. It produced 2.0 million m<sup>3</sup> of sawnwood and 55,000 m<sup>3</sup> of plywood and exported about 100,000 m<sup>3</sup> of logs and 41,000 m<sup>3</sup> of sawnwood (ITTO 2005). The wood-processing sector is run-down; most mills are fully depreciated, obsolete and not properly maintained. The sector runs at 30–40% of installed capacity and recovery rates are generally low. There is also a critical shortage of raw material for the timber industry, which is unable to process small-dimension plantation materials. Once a significant exporter, Nigeria is now a net importer of primary forest products: in 2002 imports of forest products were valued at an estimated US\$123 million, compared to exports of US\$18.5 million (of which US\$14 million was accounted for by sawnwood) (FAO 2005b).

**Non-wood forest products.** Marketed NWFPs include *Acacia senegal* (gum arabic), rattan and fibres such as *Raphia* spp, *Garcinia afzelii* (chewsticks), and sheabutter from nuts of *Vitellaria paradoxa* (syn. *Butyrospermum parkii*). Many NWFPs are locally traded and consumed by rural communities, including leaves (eg *Abura* spp), fruit, bark, nuts, honey, mushrooms, resins, canes and medicinal plants such as *Garcinia* spp. Wild meat is perhaps the most important NWFP, providing a source of protein for the rural population in isolated high-forest areas and in the savanna zone<sup>c</sup>. Some important plants providing edible products include: *Irvingia gabonensis*, the most important fruit tree in the forest zone; *Spondias mombin* and *Dacryodes edulis*; *Gnetum africanum* leaves as vegetables; the seeds of *Parkia biglobosa* (dawa-dawa); and the nuts of *Cola* spp. Fruits of oil palm and *Raphia* spp are used widely for palm wine. In 2005, *Alamblackia* seeds in degraded forest stands were collected for the first time in Cross River State for margarine production<sup>c</sup>.

## Forest for protection

**Soil and water.** Programs dealing with environmental management have been in constant flux, with negative consequences. For example, the Federal Ministry of Environment (2001) stated that efforts to combat desertification “have been adversely affected by frequent shifts in policy by government. Such policy shifts have been observed to be dictated by the country's economic fortune or misfortune.” No information on effective measures to conserve soil and water was available for this report.

**Biological diversity.** Thirty mammals, ten birds, four reptiles, 13 amphibians and 172 plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, 17 mammals, six birds, twelve amphibians and 69 plants are found in forests (IUCN 2004). *Gossweilerodendron balsamiferum*, a tree species that is endemic to the region and harvested in Nigeria, is listed as endangered on the IUCN red list due to over-harvesting and habitat loss (ibid.). Two plant species are listed in CITES Appendix I and 44 in Appendix II (CITES 2005).

**Protective measures in production forests.** The principal constraints on conservation in the production PFE include poaching, over-harvesting, illegal burning, grazing and deforestation<sup>c</sup>. Few protective measures are undertaken in many forest reserves<sup>c</sup>.

**Extent of protected areas.** According to UNEP-WCMC (2004), 1.01 million hectares of forest are in protected areas conforming to IUCN protected-area categories I–IV, including about 418,000 hectares of lowland evergreen broadleaved rainforest and 512,000 hectares of unclassified forest. The federal government controls the eight national parks through the National Parks Service. Nature conservation laws include the 1916 Wild Animals Preservation

**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
1,010	1,010	n.d.	n.d.	n.d.

Act (consequently modified and adopted by the states<sup>c</sup>), the 1985 Endangered Species Decree and the 1976 Land Use Act. The first National Park, Kainji Lake, was established in 1973; the Chad Basin, Cross River, Gashaka-Gumti, Old Oyo and Yankari national parks in 1993; and the Kamuku and Okomu national parks in 1999. Five of these national parks are located close to borders with neighbouring countries, suggesting potential for transboundary conservation. Some national parks have been degraded due to illegal hunting and logging, the smuggling of primates, grazing and illegal burning.

**Estimate of the area of forest sustainably managed for protection.** According to state and federal officials<sup>c</sup>, about 500,000 hectares of protection PFE could potentially be managed sustainably. However, due to a lack of clear information on what is happening in the field, the generally widespread problems of degradation, illegal logging, poaching and encroachment, and the lack of data on management plans and their implementation, the area of protection PFE currently being managed sustainably is not estimated here (Table 4).

### Socioeconomic aspects

**Economic aspects.** The forest sector contributed only 0.5% to Nigeria's GDP in 2001 (FAO 2003). Although forests do provide a major part of domestic energy, food and medical supplies, these are not fully reflected in formal national accounts. A major problem facing Nigerian forestry is inadequate funding. In 1993, the federal government urged state governments to pay 10% of forestry revenues into a trust fund for forest management. However, only a few state governments have implemented this proposal<sup>c</sup>. The setting and collection of forest revenues is at the discretion of state governments and sometimes local communities<sup>c</sup>, so there are large variations in the fees charged in different regions; for instance, the stumpage rate

for *Mansonia altissima* varies from 1,000 Nigerian naira in the state of Ekiti to 225 naira in Kogi. This ad hoc administrative setting of royalties causes many problems in the Nigerian forest sector.

**Livelihood values.** Forest products, particularly NWFPs, support the subsistence of local communities. An estimated 25 million people are greatly dependent on forest resources for their livelihoods<sup>c</sup>. Hunting and fishing are important activities. No information was available on the extent of sustainable rural-based programs to stabilize ecosystems and diversify products in order to meet the continuing needs and livelihoods of forest-dependent communities.

**Social relations.** The sharing of benefits from forestry activities between state governments and local communities varies from state to state. State governments are supposed to share a percentage of any revenues collected from forestry activities outside forest reserves (on average 25–40% in the savanna and 30–35% in the closed forest<sup>c</sup>) with local communities, but this is often not done in practice. The continuing decline and degradation of forest resources in Nigeria suggest that the relationship between local communities and forest administrations is not conducive to forest conservation and SFM in most of the high-forest states of Nigeria<sup>c</sup>.

### Summary

There are several obstacles to SFM in Nigeria. These include the discretionary power of government to de-reserve or harvest the forests; the lack of a coherent forest policy; the prevalence of illegal logging and harvesting of NWFPs in most of the high-forest states; chronic under-resourcing of forestry programs and forest management; overlapping responsibilities among federal, state and local governments and excessive bureaucracy; the lack of inter-sectoral coordination; and the overall absence of reliable data on which to base forestry planning and development. Nigeria has a

long history of forest management and the formal goal is to achieve self-sufficiency in all aspects of forest production; however, the country, once a significant exporter, is now a net importer of primary forest products and considerable work must be done to achieve this goal.

## Key points

- Nigeria has an estimated PFE of 4.11 million hectares, comprising 2.72 million hectares of natural production forest, 1.01 million hectares of protection forest and 375,000 hectares of planted forest. The PFE covers less than 5% of Nigeria's total land area.
- Data are generally weak and the federal government cannot confirm the accuracy of the data presented herein<sup>c</sup>.
- A forest reserve system was created in 1937 covering 9.7 million hectares (10% of the land area), but much of this is no longer forested.
- The goal of the 1988 forest policy is to expand the forest estate from 10% to 20%, but this has not occurred.
- Insufficient information was available to estimate the area of PFE under SFM.
- The forestry sector is administered at the federal, state and local government levels according to the Nigerian constitution. However, there is a lack of clarity in the mandates of the three levels.
- The main concerns of the federal government are to provide an adequate policy framework for the states and to support afforestation and conservation programs.
- State governments are solely responsible for the management of forest resources and the coordination of forest development activities with local communities.
- Forest production has fallen, creating an imbalance between supply and demand. From its previous status as a significant exporter of forest products, Nigeria has become a net importer.
- The wood-processing industry is characterized by outdated technology, poor recovery and inefficiency.

- A National Forestry Development Program designed to encourage community plantation development is in place.
- A proportion of revenues from timber should go to local communal landowners but, in practice, funds are often diverted, reducing the incentive for local people to protect forests.

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# TOGO



\* For legend see page 58

## Forest resources

Togo has a land area of 5.68 million hectares and a population of about 4.6 million people. It lies north of the Gulf of Guinea in West Africa between Ghana in the west and Benin in the east. There is a narrow coastal belt and an extensive inland plateau, rising from 60 m to 450 m towards the north. The Atakorian Mountains stretch from southwest to northeast and cover much of western Togo. The highest peak (Mt Agou) reaches an altitude of 986 m. There is little forest in Togo. FAO (2005a) estimated the forest area at 510,000 hectares in 2000; the government of Togo estimated 1.09 million hectares of forest area<sup>a</sup>, a large part of which is covered by bush and tree savanna. A third estimate (631,000 hectares) can be derived from the data for forest types given below (excluding savanna but including 'secondary forest and agricultural land').

**Forest types.** The scarcity of forest is due to both low precipitation and deforestation. Apart from a few fragments of closed semi-deciduous forests in the southwest, covering around 400 hectares, there are only a few small islands of moist and dry forests in the south and centre and gallery forests along watercourses. The majority of the forest area is savanna, which extends from the Guinean into the Sudanian vegetation zone. On the plateau, dense savanna forests are characterized by *Ceiba pentandra*, *Daniellia oliveri* and *Butyrospermum paradoxum*. Farther north, *Khaya senegalensis* and *Prosopis africana* predominate, along with the palm *Borassus aethiopum*. There are stands of semi-deciduous closed forest in the mountains, with *Antiaris africana* and *Chlorophora excelsa* among the most typical species. Areas of the main forest types are estimated as follows for 2003<sup>c</sup>:

- semi-deciduous forests (*forêts denses semi-décidues*)  
106,400 hectares
- montane forests (*forêts de montagne*)  
46,500 hectares
- closed dry forests (*forêts denses sèches*)  
25,500 hectares
- tree savanna (*savanes arborées*)  
594,000 hectares
- secondary forests and agroforestry land  
453,000 hectares

**Dynamics of forest resource change.** Deforestation is high relative to the total area of forest and is estimated to have been an average 21,000 hectares per year over the past 12 years<sup>a</sup>. The highest deforestation rates have been observed in the more humid area, where forests are important in water-

Table 1 PFE

Estimated total forest area, range (million hectares)	Total closed natural forest ('000 hectares) Source: FAO 2001	PFE ('000 hectares) <sup>d</sup>			
		Production		Protection	Total
		Natural	Planted		
0.51–1.09	272	41	14	313	368



shed protection. The major threats to the scarce remaining dense forests include uncontrolled bush-fires (the main cause of deforestation in non-PFE forested land), excessive fuelwood extraction, shifting cultivation for annual crops, and illegal cutting of the few remaining commercial tree species. Uncollected forest fires occur regularly at the end of the drier seasons and cause damage to already degraded forest areas. Over the past 30 years, the frontier of cotton plantations (in particular in the southern zone around the forest of Abdoulaye and in the western Tchilla-Monota forest area) has expanded at the expense of forest. Another reason for larger-scale conversion of forests is the introduction of new varieties of coffee adapted to local conditions.

**Permanent forest estate.** According to the government of Togo, there are 502,000 hectares of PFE, comprising 488,000 hectares of degraded closed natural forests and 14,000 hectares of planted forests<sup>a</sup>. This PFE is mainly located within 83 forest reserves (*forêts classés et forêts sacrées*) with a total area of 773,811 hectares; these are encroached upon by local people to a varied degree<sup>a</sup>. The forest reserves, mostly created in the colonial era (before 1960), now consist of heavily degraded primary forests, open secondary forests, planted forests and human-induced savanna dominated by *Ceiba pentandra*. The estimate in Table 1 is somewhat lower than the official estimate to allow for the additional deforestation that is believed to have taken place<sup>c</sup>.

**Planted forests.** There are about 38,000 hectares of planted forests, 24,000 hectares being outside the PFE<sup>a</sup>. Plantations are often located inside the forest reserves, but privately owned planted forest areas are now being developed.

## Institutional arrangements

**Forest tenure.** There are two types of forest tenure: public forest and private forest. Closed forests and dense tree savanna are generally part of public forest reserves owned by the state. In all forest reserves, user rights for local communities exist according to the colonial forest code of 1938 (articles 12–18). The legal situation, however, remains unclear; because of this, perhaps, most forest reserves are increasingly threatened by conversion under shifting cultivation. Outside the reserves, all trees and plantations belong to local

communities and private citizens, with no strict control from the state, although such off-reserve forests provide most of the forest products sold locally.

**SFM policy framework.** Although Togo participated in the C&I processes of ITTO, Dry-zone Africa and ATO/ITTO, no adequate framework for SFM has yet been developed. No strategic plan or actions are foreseen beyond securing forest reserves from conversion and encroachment.

**Forest policy and legislation.** Forest use is regulated by the 1938 forest code and the environmental code of 1988. The 1938 code has been amended by subsequent regulations, such as Decree 84/86 of April 1984. A new forest code was submitted to the Legislative Assembly but as of the end of 2005 no decision had been taken on its implementation.

A new forest policy was elaborated at the beginning of 2000 and is based on the following principles: the involvement and empowerment of the people, the integration of forestry into rural development, and the rationalization and decentralization of forestry planning. There is a National Forestry Action Program (*Plan d'Action Forestier National – PAFN*) and a National Environmental Action Plan (*Plan National d'Action pour l'Environnement – PNAE*), the latter adopted in 2000. In addition, an environmental management plan derived from the latter includes rules for the management of forest ecosystems and guidelines for the conservation and use of biological diversity.

A law approved in 1998 (Law 98-006) and modified in 2001 stipulates the political commitment of Togo to decentralized management in rural areas. Communes, prefectures and regions have become territorial authorities (*collectivités territoriales*), with legal status and financial independence. These authorities have responsibilities for the management of the state domain and on environmental issues. Communes and prefectures have an important stake in the management of forest reserves. Villages adjacent to forest reserves generally have a forest committee (*Comité villageois de Développement – CVD*), which takes care of local interests in the use of the forest reserves and is responsible for the management of committed forests. So far, however, overall responsibility for natural resource management has mostly remained with the central Ministry for Environment and Natural Resources

**Table 2 Some commonly harvested species for industrial roundwood<sup>c</sup>**

Timber species	Remarks
<i>Tectona grandis</i> (teak)	From planted forests, production about 40,000 m <sup>3</sup> per year
<i>Khaya grandifoliola</i> (acajou)	From natural forests, less than 1,000 m <sup>3</sup> per year
<i>Chlorophora excelsa</i> (iroko)	From natural forests, less than 1,000 m <sup>3</sup> per year
<i>Antiaris africana</i> (ako)	From natural forests, less than 1,000 m <sup>3</sup> per year
<i>Triplochiton scleroxylon</i> (ayous)	And 12–15 other species, totalling under 40,000 m <sup>3</sup> per year

(*Ministère de l'Environnement et des Ressources Forestières – MERF*).

**Institutions involved in forests.** MERF is in charge of forests. Responsibilities were reorganized in 1996 and new institutional reforms proposed in 2001. According to the new scheme, there are five departments to administer the environment and forests: the Directorate for Administration, Finance and Planning (*Direction de l'Administration, des Finances et de la Planification*); the Directorate for the Environment (*Direction de l'Environnement*), responsible for overall environmental policies; the Directorate for Forests and Water (*Direction des Eaux et Forêts*), responsible for forest policy and law enforcement; the Directorate for Green Space (*Direction des Espaces Verts*), responsible for urban forestry; and the Directorate for Fauna and Hunting (*Direction de la Faune et de la Chasse*). A parastatal organization, the Office for Forest Development and Harvesting (*Office de Développement et d'Exploitation des Forêts – ODEF*), is responsible for the management of forest reserves, forestry extension, harvesting and reforestation activities<sup>a</sup>. The only forestry training institute in the country (INFA in Tové), which has been closed since 1990 because of a shortage of funds, was expected to start forestry classes again in 2004. There is no forest research institute.

In 2002, 937 people were engaged in the forest administration, only eight of them with higher education in forestry and environmental management<sup>a</sup>.

Some small national NGOs are concerned with local forestry development, but their resources are meagre. There has been a general trend towards wider public participation in the management of forests. Communities and NGOs are often involved in forest protection measures such as fire protection

(*brigades de feux de brousse*). There has also been some recent investment by the private sector in teak plantations.

## Status of forest management

### Forest for production

The rural population traditionally depends on forests and trees for fuelwood, fodder, timber and other forest products; this heavy dependence generates great pressure on forests. Most of the 83 remaining forest reserves are now threatened. They can be divided into five classes, as follows:

- (i) Class I: comprises 18 converted forest reserves that have been cleared and this land-use conversion is irreversible. The land will support agriculture or has become degraded;
- (ii) Class II: comprises six heavily degraded reserves that contain secondary forest or urbanized forest reserves;
- (iii) Class III: comprises eight forest reserves with planted areas that are either intact or degraded and heavily degraded natural forests;
- (iv) Class IV: comprises 48 reserves in which the forest is degraded and/or transformed into secondary forest and may also contain planted areas and natural forest; and
- (v) Class V: comprises three sacred forests with more-or-less intact forests<sup>a</sup>.

A number of forest management plans have been prepared to secure the sustainable use of the main forest reserves, mainly through projects supported by international organizations including ITTO. There are no large-scale timber harvesting or forest concession areas. Cutting permits (*permis de*

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

Total	Natural			Planted			
	Allocated to concessions/ under licence	With management plans	Certified	Sustainably managed	With management plans	Certified	
41	41	5.5 <sup>a</sup>	0	5.5	14	1.2 <sup>a</sup>	0

*coupe*) are the only legal basis for small-scale timber harvesting and the cutting of single trees.

**Silviculture and species selection.** The most important commercial tree species is *Tectona grandis* (teak). Teak plantations were introduced in 1910 from Burma by the Germans and have become well adapted to the country. The species regenerates naturally and is widely used in agroforestry plantations, as street trees and in commercial planted forests. A silvicultural system to induce natural regeneration has been developed by ODEF and is practised in some of the older teak stands.

Timber harvesting takes place in some forest reserves, in savanna, in planted forests and among off-forest trees. Apart from teak, no species is used in large quantities. Besides those listed in Table 2, species harvested include: *Azelia africana*, *Lophira alata*, *Terminalia* spp, *Isobertinia doka*, *Daniellia oliveri*, *Dichostachys glomerata*, *Parkia biglobosa*, *Bauhinia* spp, *Pterocarpus erinaceus* and *Anogeissus leiocarpus*. In the future there may be an increased commercial use of trees outside reserves, in particular of *Ceiba pentandra* (fromager), *Cola gigantea* and *Albizia ferruginea*.

**Planted forest and trees outside the forest.** The main planted species is teak (18,000 hectares). The planned planting rate of teak is 300 hectares per year, mainly on agricultural land using the *taungya* system<sup>c</sup>. This planting rate is generally considered inadequate to meet the timber needs of the country; a rate of 2,000 hectares per year of industrial plantations would be needed to meet domestic requirements for construction timber alone<sup>c</sup>. Off-forest trees in the savanna, including teak, limba, ayous, ceiba and cola, are providing more and more of the raw material for local sawmills.

**Forest certification.** No forest has been certified. Teak plantations established by the private sector might have the potential and market prospects to justify certification, but no initiative has been taken yet.

**Estimate of the area of forest sustainably managed for production.** An estimated 17,500 hectares of production forest are covered by management plans, including 10,900 hectares of savanna, 5,500 hectares of dense natural forest and 1,200 hectares of plantations<sup>a</sup>. A total of 4,600 hectares of teak and eucalypt plantations are harvested according to harvesting plans, but only 1,200 hectares of these have full management plans<sup>a</sup>. The area of natural PFE managed sustainably is estimated to be at least 5,500 hectares, comprising the core areas of three forest reserves – Eto, Haho-Baloé and Missahoe – that have been especially enriched and managed with effective support from the local population<sup>c</sup> and from ITTO projects (Table 3).

**Timber production and trade.** Total roundwood production was an estimated 5.85 million m<sup>3</sup> in 2003, of which 5.65 million m<sup>3</sup> was fuelwood (FAO 2005b). Traded fuelwood recently averaged 2 million m<sup>3</sup> per year<sup>a</sup>, to which should be added an estimated informal production<sup>c</sup> of more than 6 million m<sup>3</sup>. Industrial roundwood production amounted to an estimated 208,000 m<sup>3</sup> in 2003, down from 314,000 m<sup>3</sup> in 1999 (ITTO 2004, 2005); most of this wood comes from planted forests. Timber products from neighbouring countries (mainly Ghana) are exported from the free port of Lomé. Private investors have recently developed small-dimension timber-processing units for teak<sup>c</sup>.

**Non-wood forest products.** Wild meat is the most important NWFP from forest reserves. Another considerable source of income, though illegal, has been the collection of reptiles for export. Fruits, roots and medicinal plants are also collected. The remaining forests are heavily degraded and many NWFPs are no longer available in the required quantities or qualities.

At least 18 reptile species are produced in animal farms for export, in particular *Python regius* (royal python), but also chameleons (*Chamaeleo gracilis*

**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
313	60.9	200	n.d.	n.d.

and *C. senegalensis*), big lizards (*Varanus niloticus* and *V. exanthematicus*), and turtles such as *Kinixys belliana*, *K. erosa* and *K. homeana*.

### Forest for protection

**Soil and water.** An estimated 200,000 hectares of forest are managed primarily for the protection of soil and water<sup>a</sup>. An estimated 5,713 hectares of protection plantations had been established by the end of 2002 in forest reserves – Kara, 362 hectares; Namon, 413 hectares; Asrama, 338 hectares; and Avétnou, 1,100 hectares<sup>a</sup>.

**Biological diversity.** Togo is home to more than 1,450 forest-dependent plant species, more than 600 birds, 146 mammals, 138 reptiles and 42 amphibians<sup>a</sup>. A national strategy for biological diversity was prepared in the late 1990s. It contains a catalogue of rare, endangered and endemic species; tree species listed include *Entandrophragma cylindricum*, *Terminalia superba*, *Terminalia ivorensis*, *Piptadeniastrum africanum*, *Khaya grandifoliola* and *Khaya ivorensis*<sup>a</sup>. Eleven mammals, two birds, three reptiles, three amphibians and ten plants are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species; of these, eight mammals and three amphibians are found in forests (IUCN 2004). One plant species is listed in CITES Appendix I and seven in Appendix II (CITES 2005).

**Protective measures in production forests.** Provisions are made in the 1938 forest code and Decree 84/86 to prohibit logging on slopes susceptible to erosion as well as for the protection of streams, springs and watersheds.

**Extent of protected areas.** The government of Togo estimated that the area of forest in IUCN protected-area categories I-IV was 255,640 hectares, 192,000 hectares being semi-deciduous mountain forests and 63,640 hectares savanna<sup>a</sup>. According to UNEP-WCMC (2004), 60,900 hectares of forest are in protected areas conforming to IUCN protected-area categories I-IV; the forest type for

most of this area is unclassified. No information is available on the area of protection PFE covered by management plans or the existence of effective protective measures to secure the areas from encroachment and degradation.

**Estimate of the area of forest sustainably managed for protection.** Insufficient data were available for an estimate to be made on the area of protection PFE under SFM.

### Socioeconomic aspects

**Economic aspects.** Some socioeconomic measures have had negative side-effects on forest management. The devaluation of the regional currency (FCFA) in 1994 has tended to encourage the misuse of resources, while the privatization of profitable enterprises has limited the expansion of forest areas because of the reluctance of private operators to make long-term investments. It is not yet clear what the effects of decentralization and the hoped-for greater transparency will be. Since 2000, there has been some modest private investment in teak plantations on private land. The contribution of the forest sector to national GDP is very small, although the importance of informal activities (especially related to wood energy) is considerable. Private enterprises employ about 1,000 salaried full- and part-time workers. It is estimated that forestry provides about 90,000 jobs in the informal sector, 77% of them for women and children, many in commercial fuelwood collection and charcoal-making.

**Livelihood values.** The few existing forests are often considered by rural people to be under-utilized reserves of land; thus they are heavily encroached upon and claimed for subsistence production. Forest reserves provide an important source of protein for people living in rural areas. Forests also are a place of ritual and spiritual significance for many ethnic groups.

**Social relations.** The participation of local stakeholders in forestry decisions and management is not well developed.

## Summary

The main difficulty in protecting and managing forests in Togo is the heavy pressure on them from an impoverished rural population. Indeed, pressure on the existing forest reserves is already high and the Ministry for Environment and Natural Resources, which is in charge of forests, is unable to secure their integrity. Capacity for forest management is low, and improvement is inhibited by a lack of means. This affects many forestry operations: for example, management plans are confined to a few teak plantations, scarcely 300 hectares of new plantations are established annually, and protection against fire is mostly ineffective. A process of decentralization has been initiated, whereby communes, prefectures and regions have responsibilities for the management of the state domain and on environmental issues, but the effects of this process on forest management are yet to be seen.

## Key points

- Togo has an estimated PFE of 368,000 hectares, comprising 41,000 hectares of natural production forest, 313,000 hectares of protection forest and 14,000 hectares of plantations (and additional private plantations outside the PFE).
- At least 5,500 hectares of natural-forest production PFE are considered to be managed sustainably. Insufficient information was available for an estimate to be made of the area of protection PFE so managed.
- Forest reserves and protected areas are not effectively protected or managed, and many are heavily degraded and subject to uncontrolled encroachment, the illegal gathering of NWFPs, poaching and timber theft.
- Forestry training capacity is very limited, and fewer than ten personnel in the forestry administration have higher education in forestry or environmental management.
- There is a lack of a national SFM framework and of forest management standards for natural forests.
- Privately owned, planted forests are now being developed and will complement the teak and other plantations in the PFE.
- However, planted forests in the PFE are small and generally lack proper planning, monitoring and silvicultural follow-up.
- Many villages adjacent to forest reserves have forest committees to manage local interests in the use of forest reserves.

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- <sup>c</sup> Information derived from the report of, and discussions with participants at, a training workshop on ITTO criteria and indicators, held 21–24 July 2003, Kpalimé, Togo, attended by 35 people from government, civil society and the private sector.
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