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STATUS AND TRENDS IN FOREST MANAGEMENT IN CENTRAL AFRICA

by
Isabelle Amsallem
Consultant

In collaboration with

Pape Djiby Koné (FAO Regional Office for Africa, Accra)
and
Mette Løyche Wilkie (FAO, Rome)

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Comments and feedback are welcome.

For further information please contact:

Ms. Mette Løyche Wilkie, Forestry Officer (Forest Management)
Forest Resources Development Service
Forest Resources Division
Forestry Department
FAO
Viale delle Terme di Caracalla
I-00100 Rome (Italy)
e-mail: Mette.LoycheWilkie@fao.org

Or FAO Publications and Information Coordinator: Forestry-Information@fao.org

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ABBREVIATIONS

AAA	*Associação Angolana do ambiente*, Angola
ADIE	Environmental Data Development Association (*Association pour le développement de l'information environnementale*)
AFAN	African Forest Action Network
ATO	African Timber Organization
C&I	Criteria and indicators
CAR	Central African Republic
CARPE	Central African Regional Programme for the Environment
CCD	Convention to Combat Desertification
CEFDHAC	Conference of the Central African Moist Forest Ecosystems
CEMAC	Central African Economic and Monetary Community
CENADEFOR	National Centre for Forest Development, Cameroon
CENAREST	National Centre for Technological and Scientific Research, Gabon
CFAD	*Concession forestière sous aménagement durable* (forest concession under sustainable management), Gabon
CFU	Community forestry unit
CIFOR	Centre for International Forestry Research
CNIE	National Centre for Forestry Research, Democratic Republic of Congo
CNLIFBAC	National Committee for the Prevention of Fires, Brushfires and other Calamities, Central African Republic
CNPAF	National Centre for Wildlife Protection and Management, Central African Republic
CNRF	National Centre for Forestry Research, Congo
COMIFAC	Council of Ministers in charge of Central African forests
CPAL	Limba Pilot Afforestation Centre, Congo
CPSE	Planning, Monitoring and Evaluation Unit, Gabon
CRUFE	Conservation and Rational Use of Forest Ecosystems, Equatorial Guinea
CTFT	Tropical Forest Technical Centre (*Centre technique forestier tropical*), France
DFAP	Directorate of Wildlife and Protected Areas, Cameroon
DFC	Directorate of Wildlife and Hunting, Gabon
DFPE	Directorate of Forestry and Environmental Protection, Chad
DGEF	General Directorate of Waters and Forests, Gabon
DGRN	Directorate of Natural Resource Management, Democratic Republic of Congo
DIARF	Directorate of Forest Inventory, Management and Regeneration, Gabon
DINOPA	National Directorate for Fisheries and Agriculture, Angola
DLC	Diameter-limit cutting
DNACO	*Direcção nacional da conservação da natureza* (National directorate of nature conservation), Angola
DNAF	National Directorate of Agriculture and Forestry, Angola
DRC	Democratic Republic of Congo
EAP	Environmental Action Plan
ECCAS	Economic Community of Central African States
ECOFAC	Conservation and Rational Use of Forest Ecosystems in Central Africa
ENEF	*Ecole nationale des eaux et forêts*, Gabon
ERAIFT	Post-Graduate School for Integrated Management in Tropical Forests, Democratic Republic of Congo
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDFT	Fund for Forest Development and Tourism, Central African Republic
FMU	Forest Management Unit
FONADEFO	National Forest Development Fund
FORAFRI	Project for capitalization and transfer of existing results from research on tropical humid forests in Africa
FPTF	Future of People of the Tropical Forest
FRCF	Fund to reconstitute the forest capital, Democratic Republic of Congo
FS	Forest Service
FSDF	Special Fund for Forest Development, Cameroon
GD	General Directorate
GEF	Global Environment Facility

GTZ	Gesellschaft für technische zusammenarbeit
HCNE	National High Committee on the Environment, Chad
ICCN	Congolese Institute for Nature Conservation, Democratic Republic of Congo
ICRA	Central African Institute for Agricultural Research, Central African Republic
IDF	*Instituto de desenvolvimento florestal* Forest Development Institute, Angola
IFIA	Inter-African Forest Industries Association
IJZBC	Institute of Zoological and Botanical Gardens, Democratic Republic of Congo
INCN	National Institute for Nature Conservation, Burundi and Democratic Republic of Congo
INECN	National Institute for Nature Conservation and Environment, Burundi
INERA	International Institute for Agricultural Research and Studies, Democratic Republic of Congo
IRAD	Institut de recherche agronomique pour le développement, Cameroon
ISAR	Institute of Agricultural Sciences, Rwanda
ITTO	International Tropical Timber Organization
ITTTA	International Technical Tropical Timber Association
IUCN	International Union for the Conservation of Nature
IZCN	Zaire Institute for Nature Conservation, Democratic Republic of Congo
MAB	Man and Biosphere
MEE	Ministry of Environment and Water Resources, Chad
MEEFCP	Ministry of Environment, Water Resources and Forestry, Central African Republic
MHD	Minimum harvest diameter
MINADER	*Ministerio da agricultura e do desenvolvimento rural* (Ministry of Agriculture and Rural Development), Angola
MINAGRI	Ministry of Agriculture and Livestock, Rwanda
MINATE	Ministry of Territorial Development, Environment and Tourism, Burundi
MINDIC	Ministry of Trade and Industrial Development, Cameroon
MINEF	Ministry of Environment and Forests, Cameroon
MINICOM	Ministry of Commerce, Industry and Tourism, Rwanda
MINREST	Ministry of Scientific and Technical Research, Cameroon
NWP	National Working Party on Sustainable Forest Management and Certification, Gabon
OBAE	*Office des bois d'Afrique équatoriale*, Gabon
OCATOUR	*Office du tourisme*, Central African Republic
OCB	*Office congolais des bois*
OCF	*Office congolais des forêts*
OCFSA	Organization for Wildlife Conservation in Central Africa
OCIPEF	*Oficina de control, información y promoción de las especies forestales*, (Office of supervision, information and promotion of forest species), Equatorial Guinea
ONADEF	National Forest Development Service, Cameroon
ONAREF	National Forest Regeneration Service, Cameroon
ONB	National Biodiversity Organization, Gabon
ONBG	*Office national des bois du Gabon*
ONF	*Office national des forêts*, Congo and DRC
ORTPN	Rwanda Office of Tourism and National Parks
PALCD.	National Action Plan to Combat Desertification
PARAC	Regional Plan for Central Africa
PARF	Forestry Research Support Project, Central African Republic
PARN	National Resource Management Project, Central African Republic
PARPAF	Support Project for the Preparation of Forest Management Plans, Central African Republic
PCI	Principles, Criteria & Indicators
PDFG	Gabon Forest Development Project
PEA	*Permis d'exploitation et d'aménagement* (Harvesting and management permit)
PFA	Associated Forest Permit, Gabon
PNADD	National Plan for Environment and Sustainable Development, Equatorial Guinea
PNLCD	National Plan to Combat Desertification, Chad
PSFE	*Programme sectoriel forêts et environnement*, Gabon
RAPAC	Network of Protected Areas in Central Africa
REIMP	Regional Environment Information Management Programme
REPOFBAC	Congo Basin forestry policy network
RIL	Reduced-impact logging
SAP	*Structural Adjustment Programme*
SDIAF	Sub-Directorate for forest management and inventories, Cameroon

SEA	State Secretariat for the Environment, Angola
SMP	*Simple management plans*
SNBG	*Société nationale des Bois du Gabon*
SNER	National Environmental Strategy, Rwanda
SNPA–DB	National Strategy and Action Plan for Biodiversity, Democratic Republic of Congo
SNR	National Reforestation Service, Congo and DRC
SPIAF	*Service permanent d'inventaire et d'aménagement forestiers*, Democratic Republic of Congo
STFO	*Société technique de la forêt d'Okoumé*, Gabon
TFAP	Tropical Forests Action Plan
UAIC	Congolese Afforestation Unit, Congo
UGZ	Zonal Management Unit
UNDP	United Nations Development Programme
UPARA	Pilot Management Reforestation and Agroforestry Units, Congo
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

INTRODUCTION

The Central African sub-region, with natural forest[1] covering some 57 percent of the land area, is first and foremost a forest region. One of the world's last remaining extensively forested areas – this vast, near-uniform tropical rainforest stretches across most countries of the Congo Basin: Gabon, Equatorial Guinea, Congo, most of Cameroon and the Democratic Republic of Congo, and part of the Central African Republic. Central African tropical forests rank among the world's largest, second in size only to the Amazon rainforest. This is an area of outstanding biodiversity with vast numbers of endemic species. It accounts for 35 percent of Africa's total forest cover and six percent of global forest cover[1].

Despite the sub-region's low rate of deforestation compared to other parts of Africa, the Central African forest is nonetheless subject to degradation. The extent and spread of degradation, however, is difficult to quantify and evaluate. Among the many and varied causes of deforestation and degradation are shifting cultivation, logging, the pressure of people on the forest, etc. The countries of Central Africa are conscious of these threats to their ecosystems and, with the support of the international community, are doing their utmost to promote sustainable forest management. Beginning in 1985 with the implementation of Tropical Forests Action Plans (TFAPs), all Central African countries have subsequently formulated forest development policies embodying the development principles laid down by the Conference of Rio. Most have also completed (or are in the process of preparing) Environmental Action Plans (EAP). Two regional organizations, to which most Central African countries belong, have been mandated to coordinate and promote sustainable forest management and development activities. These are the African Timber Organization (ATO), founded in 1976, and, since 1996, the Conference of the Central African Moist Forest Ecosystems (CEFDHAC), also referred to as the Brazzaville process. More recently, the Council of Ministers in charge of Central African forests (COMIFAC) was formed for the purpose of implementing the recommendations of the Meeting of Central African Heads of State, more familiarly known as the "Yaoundé Declaration on the Forest". Active regional forest management programmes such as the ECOFAC Programme on the rational utilization and conservation of Central African forest ecosystems, working in seven Central African countries to reconcile conservation with sustainable development, REIMP, the Regional Environment Information Management Programme, CARPE, the Central African Regional Programme for the Environment, and others.

This paper sets out to describe and review forest management status and trends in Central Africa at country and sub-regional levels. The goal is to report on efforts in the sector in the last twenty years or so, and to highlight the various problems and constraints these countries face in the implementation of sustainable forest management measures.

The study covers eleven countries. In addition of Angola, these are the CEFDHAC countries – Burundi, Cameroon, Central African Republic, Congo, the Democratic Republic of Congo, Equatorial Guinea, Gabon, Rwanda, São Tomé and Principe, and the COMIFAC countries – Burundi, Cameroon, Central African Republic, Congo, the Democratic Republic of Congo, Equatorial Guinea and Chad.

[1] Not counting either Angola or Chad. FAO, 2001. Global Forest Resources Assessment 2000. Main Report. FAO Forestry Paper 140, Rome http://www.fao.org/forestry/fo/fra/main/index.jsp.

The data contained in this document are intended to review:

- (i), the institutional and legislative framework for sustainable forest management in each country;
- (ii), national and regional forest management status through a description of past and current management measures, and;
- (iii) national and regional forest management trends.

The information was obtained directly from country data supplied by forestry institutions and agencies, together with national forestry consultants[2]. Bibliographical and Internet research round out the document. The data are by no means exhaustive and any further comments and reactions to enrich and update them on a regular basis would be more than welcome.

[2] National reports commissioned by FAO's FRA 2000 (Forest Resources Assessment 2000) and FOSA (Forestry Outlook Study for Africa) – http:www.fao.org/forestry/foda/infonote/en/t-fosa-e-2000.stm

1. REGIONAL OVERVIEW

1.1. Legal and institutional framework for sustainable forest management

1.1.1. Legal framework

Central African forestry policy orientations and concerns tend, in the main, to converge. This is particularly true for issues of environmental protection, forest conservation and renewal, participatory management, involving stakeholders in decision-making, and management implementation. New laws on the forest and/or the environment have been promulgated and voted into law in the last decade in countries such as Cameroon, Chad Equatorial Guinea, and Gabon. The most recent forest law is that of Congo in 2000. Angola, on the other hand, is the only country in the sub-region still lacking a forest law and an appropriate legal framework. Other countries have fairly old forest laws, some dating back to colonial times (the Central African Republic, the Democratic Republic of Congo and São Tomé and Principe).

1.1.2. Forest and management institutions

The status of natural forests varies from country to country. A reading of the range of forest laws brings out these main categories: state-owned (public domain) forest, communal forest, community forest and privately-owned forest. In almost every country of the sub-region, national law stipulates that all natural forest other than privately-owned forest belongs to the state and thus generally comes under the responsibility of the public forestry administrations. These may, however, sub-contract specific operations to individuals, private concerns or community organizations.

Recent institutional changes have taken the form of newly-established departments of water resources and forestry, and/or the environment, together or as separate institutions, with specific technical services. One example is Cameroon's Ministry of Environment and Forests, set up in 1992, responsible for ONADEF, the National Forest Development Service. In the Central African Republic, the administrative structure now in place is in a better position to involve all partners, particularly rural populations, in forest resource management. In the Congo, forest policy design and implementation comes under the water resources and forests administration of the Ministry of Forest Economy, and the trend is towards state disengagement in favor of the private sector and associations. In Gabon, the Ministry of Forest Economy in charge of the Environment is responsible for policy design and implementation, forest management, and monitoring the application of the rules in force. In Rwanda, the forest services have always come under the Ministry of Agriculture. In 1997 with the establishment of the Ministry of Agriculture, Livestock, Environment and Rural Development, the directorate of Forestry was eliminated and its services divided among other directorates.

Private companies are primarily European and national, but some Asiatic companies have recently become established. In place since colonial times, the European companies continue to play a major role in forest management. In Gabon, for instance, their concessions represent over 95 percent of the area under forest concessions, supplying 70 percent of the local output. These companies have recently acquired new concessions, especially in the northern part of Congo, and have expanded their activities in Cameroon and Gabon. There are also private cooperation agencies such as the International Technical Tropical Timber Association (ITTTA) and the Inter-African Forest Industries Association (IFIA), primarily composed of European groups.

The region has about twenty research and training institutions and a great many project-linked research programmes. Some of the most active are the *Ecole nationale des eaux et forêts* of Cap-Esterias in Gabon, Mbalmayo, the University of Dschang and the Garoua School of Wildlife in Cameroon, the Brazzaville Rural Development Institute, Central African Republic's *Institut supérieur de développement rural* in Mbaiki, Bangamisa, Yangambi and ERAIFT, the *Ecole régionale d'aménagement et de gestion intégrée des forêts tropicales* in Kinshasa, Democratic Republic of Congo, Burundi's *Institut supérieur d'agriculture* in Gitega, and others. Chad and São Tomé, however, have no specific forest research structures.

1.2. Status and trends in forest management

1.2.1. History of forest management and silviculture

European colonization in the late nineteenth century and the ensuing expansion of cropland profoundly altered the face of the great Central African forest, as Europeans developed the cultivation of maize, cassava, banana, plantain, yam, oil palm, cocoa and rubber. Additionally, firms specializing in the logging of high-value woods, especially red mahogany woods (*Khaya* spp., *Entandrophragma* spp., etc.), used in furniture-making, also began to divide up the forest. Large-scale logging as such, however, began only in the mid-twentieth century. Central Africa, rich in natural resources, has thus functioned historically as a vast well of raw materials for export to the industrialized countries, a role that continues to this day. This is particularly true of wood and minerals, but also, and more recently, of oil.

The main thrust of post-colonial forestry has been commercial, with several economic processes emerging, including autonomous organizing efforts by peasant communities, the emergence of local enterprises in the early stages of industrialization, and profound institutional changes designed to lay the legal groundwork to guarantee contracts and favor ownership rights.

Since 1985 and with the establishment of the TFAPs (Tropical Forests Action Plans), all countries of Central Africa have devised forest development policy objectives consonant with the development principles laid down by the Conference of Rio, some quite recently – Gabon, Cameroon, CAR, and the Congo, for example. Countries have modified their forest legislation and created the necessary incentives. Most have already prepared or are in the process of drawing up National Environmental Action Plans (NEAPs).

The 1990s featured a growing process of democratization and mounting interest in sustainable development issues in many countries of the sub-region. Sustainable development is defined as development that can meet the needs of present generations without compromising the ability of future generations to meet theirs.

An estimated 789 000 hectares[3] of forest plantations have been established in Central Africa since the end of World War II, with varying degrees of success. Like the natural forests, these forests are unequally distributed. Rwanda has 261 000 hectares, or some 40 percent of the total area under forest plantations in the sub-region, whereas desertification-menaced Chad has only 14 000 hectares. Over half of Central Africa's plantations lie in Burundi and Rwanda, the result of a vast planting programme carried out between 1975 and the early 1990s. Reforestation activities are minimal, consisting mostly of commercial replanting rather than the more costly reforestation of degraded or logged-over areas.

1.2.2. Criteria and indicators of sustainable forest management

The idea of certification is gaining ground, albeit very slowly. Designed to introduce efficient rules of protection and a certain discipline into forest harvesting, the process includes recognition of the rights of local populations, long-term economic viability, safeguarding biological diversity, the conservation of primary forest, responsible long-term management and regular monitoring. Certification means that forest products consonant with long-term environmental protection are clearly identifiable.

Criteria and indicator (C& I) tests have been conducted in Cameroon, CAR and Gabon since the mid-1990s, especially by CIFOR (the Centre for International Forestry Research), ATO (the African Timber Organization) and ITTO, (the International Tropical Timber Organization). A meeting was also held in Yaoundé in May 2001 to dovetail the criteria used by ATO and ITTO. ITTO is now in the process of setting up teaching modules in the sub-region to promote the establishment of C& I for sustainable forest management. A course is planned for the Congo in April 2002.

1.2.3. Current practices for sustainable forest management

Management objectives

Some 40 million hectares, or roughly one percent of the total land area in the sub-region, are now under natural forest managed for conservation purposes, also known as protected areas. An additional 789 000 hectares are under forest plantations, for either protection or production purposes. It is difficult to pin down the exact area of natural forest managed for other purposes, as no Central African country has supplied complete data on forest areas covered by formal, nationally approved, forest management plans in the year 2000. What can be said, however summarily, is that Chad has some 600 000 hectares of classified forest for protection or production purposes, Equatorial Guinea has 1.5 million ha under concession, Cameroon has 4 million hectares under production forest and CAR 1.7 million[3].

[3] FAO, 2001. Global Forest Resources Assessment 2000. Main report. FAO Forestry Paper 140. FAO, Rome. http://www.fao.org/forestry/fo/fra/main/index.jsp

Of the diverse lines of strategy followed in the sub-region, the most frequently encountered objectives are to ensure sustainable resource use, preserve the economic, social and ecological functions of the forest on a permanent basis, and maximize the contribution of the forest sector to national economic and social development.

Forest management plans

In terms of timber harvesting, forest management everywhere focuses on demarcating logging areas and monitoring volumes extracted. Production forests are usually contracted out to logging companies under a system of fairly long-term concessions with temporary logging permits. In Gabon, a resource inventory and a management plan proposal are obligatory prerequisites to commercial logging. State-owned forests in Cameroon and Congo have been sub-divided into Forest Management Units (FMUs), each large enough to feed an independent wood industry with sound resource use and development plans. Simple management plans are formulated for village-managed community forests. CAR's forest law stipulates that a management and harvesting permit be accompanied by a set of specifications, making the permit holder responsible for forest management. In Rwanda, Zonal Management Units (ZMUs) have been set up in certain forest areas. As a general rule, the local forest services are responsible for management activities concerning conservation, reconstitution and harvesting. The preparation of plans, forest inventories and management work are also the responsibility of the forest services. The duration of these management plans varies from one country to another, and the forest service is also responsible for monitoring management follow-up activities.

Silviculture

Experimental research designs have been set up in various countries of the sub-region (for example in CAR), to study the dynamics of natural forest systems under a variety of silvicultural treatments. The goal is to identify a set of silvicultural practices suitable for sustainable forest production and forest conservation. Trials have also been conducted on the natural regeneration of the main timber species, such as those on okoumé in Gabon. The Congo has achieved spectacular results with silvicultural research on specific local species, and on fast-growing exotics, as with cloned eucalyptus. The main species planted in the region are *Eucalyptus* spp., *Pinus* spp., *Cordia* spp., etc. Techniques include clear-felling, cleaning the under-storey, under-planting, strip planting, full planting, and others. Population densities in Rwanda and Burundi dictate the use of agroforestry and reforestation of pastoral land or land unsuitable for cultivation. About 90 percent of the households in these countries grow trees in their fields (*Calliandra* spp., *Leucaena* spp., *Cedrella* spp., etc.).

Forest conservation measures

The sub-region is world-famous for its biological diversity. It contains over 60 percent of Africa's biodiversity, and ranks first on the continent for the vast range of species in several taxonomic groups. It has nearly 100 protected areas spanning some 400 000 km², which is one percent of the land area in the sub-region. In number and area, national parks and wildlife reserves loom large in the sub-region. During a summit meeting on tropical forest conservation and sustainable management held in Yaoundé in March 1999, Central African Heads of State or their representatives signed a declaration calling for the establishment of transboundary protected areas.

The Network of Protected Areas in Central Africa (RAPAC) was established in Yaoundé by the administrations responsible for the protected areas of seven Central African countries (Cameroon, CAR, Chad, Congo, Equatorial Guinea, Gabon, São Tome and Principe). Also operating in seven countries of the sub-region is the ECOFAC Programme (Conservation and rational use of forest ecosystems in Central America), designed to link conservation with sustainable development.

Central Africa has great many projects managed by its regional offices and national government services. These include drought control projects in the sudano-sahelian zone, specific conservation projects and ecotourism projects. The wildlife of Central Africa and its nature parks, especially in the eastern part of the sub-region, have favored the exemplary development of ecotourism, particularly for viewing mountain gorillas, During the 1980s, this form of ecotourism trailed only tea and coffee as an economic earner in Rwanda. In the Democratic Republic of Congo, the income from visits to mountain gorillas in Virunga National Park from 1986 to 1991 funded activities in all protected areas in the country. Despite this, in recent years the sub-region's wildlife and protected areas have come under considerable attack from a series of armed conflicts, poaching activities, incursions of migratory herds and human settlements within protected areas, pillaging of natural resources, and other problems.

Forest protection measures

Not much data is available on fire prevention and plant pest protection in the sub-region. Wildfires can be hugely important, however, as in CAR, where half or more of the national territory burns every year in fires set by people. In Rwanda, 13 000 hectares of woodlands were destroyed by fire in 1992. Legal provisions mandating firebreaks to prevent brushfires are general throughout the subregion.

Forest harvesting practices

The many uses of the forest range from very light harvesting to varying degrees of commercial logging, in addition to removals of non-wood forest products.

Central African moist forests have considerable timber potential, consisting in part of high-value commercial species such as the so-called "red woods", mostly belonging to the Meliaceae family. Despite gradual diversification, two or three main species account for 60 to 80 percent of output in these countries. These include ayous (*Triplochiton scleroxylon*), sapelli (*Entandrophragma cylindricum*) and azobé (*Lephira alata*) in Cameroon, okoumé (*Aucomea klaineana*) and ozigo (*Dacryodes buettneri*) in Gabon, and ilomba (*Pycnanthus angolensis*) in Equatorial Guinea. Timber harvesting is still selective in most of the Congo Basin countries (Cameroon, the Central African Republic, Congo, the DRC, Equatorial Guinea and Gabon). Central Africa thus represents an area where removals lag behind production potential. Indeed, despite the floral diversity and abundance of big trees in these moist tropical forests, they actually contain only a relatively small number of technologically utilizable species, often widely scattered throughout the forest. This factor, combined with forest inaccessibility due to the lack of road infrastructure and problems with getting the logs out, mean that removals are quite often selective and substantially below harvest potential. Additionally, market conditions tend to make logging companies concentrate only on the high-quality timber mostly found in the landlocked forests of the interior. Overharvesting is on the rise, however, hand in hand with the needs of a growing population, as can be seen in Rwanda and Burundi.

The concept of reduced-impact logging is in line with the sustainable forestry management approach. This trend finds confirmation in the formulation of codes of ethics for the sustainable management of forest concession. As it happens, it is not only governments and international institutions which are getting organized in this sense. A number of private cooperation agencies such as the ITTTA (International Technical Tropical Timber Association) and the IFIA (Inter-African Forest Industries Association) are also getting involved. Since the year 2000, fourteen large forest industries groups in West and Central Africa have formulated such codes. The objectives are to contribute to the economic development policies of the countries concerned, improve the living conditions of local communities, promote the sustainable management of forest ecosystems, and foster both the image of the forest industries and the forest products trade.

Forest laws and policies concerning harvesting are not all equally effective. One noteworthy example, however, is Cameroon's Law n°94-01 of 20 January 1994 covering forestry, wildlife and fishing. It sets forth a series of measures, including the formation of FMUs less than 200 000 hectares in area, a ban on log exports as of January 1999, compulsory processing of 70 percent of output directly within the country, and the implementation of the community forest concept.

People's participation in forest management

State monopolies over forest management have not guaranteed sustainable resource use in the past. Most Central African forests are now state-owned, although some countries, among them Cameroon, CAR and Gabon, do maintain customary rights. New avenues are currently being explored such as collective responsibility for forest management, decentralization, and so forth, with the emergence of practical measures such as community forests, management for wood production with local participation, and the establishment of community-owned reserves. These management methods feature a certain amount of job transfers among forestry staff and a move towards the private sector in the form of NGOs and projects on the part of certain state structures and organizations. The results have often been mixed, however, and in some cases initiatives are still very tentative.

Concerning taxation, the legislation varies from one country to another, but all stipulate that a portion of tax revenue from the forest is to go to the communities bordering the forest concessions. Some countries in the sub-region have actually decided to use a small fraction of this income for directly or indirectly financing local communities. The principle behind these initiatives is quite interesting, expressing a concern with redistributing some of the income from forest enterprises to local people — who are otherwise frequently excluded from the benefits of these undertakings.

One major innovation is Cameroon's "community forestry" concept, which consists of direct public involvement in forest resource management. Local people are given the opportunity to share in the general benefits produced by forest enterprises, and at the same time contribute to forest conservation.

1.2.4. Special programmes and incentives to promote sustainable forest management

All or nearly all countries in the sub-region are signatories of agreements and/or the major international conventions having to do with the forest. The International Technical Tropical Timber Agreement, the Washington Convention (CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora), the RAMSAR Convention, the Convention on Biological Diversity, the Convention to Combat Desertification and the Convention on Climate Change.

As a general rule, these same countries also take part in a number of regional initiatives and programmes, such as:

- ECOFAC (the Conservation and rational use of forest ecosystems in Central Africa), launched in 1991, solely for the Congo Basin countries and an integral strategical component of the 1992 Regional Plan for Central Africa (PARAC),
- CARPE (the Central African Regional Project for the Environment), a long-term, twenty-year project, which looks at the various component factors in forest biodiversity, identifying measures to reduce deforestation and biodiversity loss in the Congo Basin countries.
- REIMP (the Regional Environment Information Management Programme), designed to promote sustainable, concerted harvesting of natural resources in the Congo Basin countries (Cameroon, CAR, Congo, the Democratic Republic of Congo, Equatorial Guinea, São Tomé and Principe). It is managed by ADIE (the Environmental data development system), based in Libreville;
- RAPAC (Network of Protected Areas in Central Africa) and AFAN (African Forest Action Network)
- The SAP (Strategic Action Plan for environmental resources and biological diversity of Congo Basin Ecosystems), formulated by CEFCHAC and approved at its third session held in Bujumbura, June 2000. Its intent is to inaugurate a global vision of conservation and biodiversity throughout the region.

Two regional organizations to which most Central African countries belong (excepting Chad and Angola), are working to coordinate and promote sustainable forest management and development activities. These are ATO (the African Timber Organization) and the Conference of the Central African Moist Forest Ecosystems (CEFDHAC), founded in 1996. CEFDHAC has met three times in plenary session. The meetings were held in Brazzaville in May 1996, Bata in 1998 and Bujumbura in June 2000. The next plenary session is scheduled for June 2002 in Kinshasa. Other institutions, also working in the forestry sector and coordinating efforts at the regional level, include: AFAN (African Forest Action Network, 1994), which brings together NGOs working in the forestry sector, ECCAS (the Economic Community of Central African States), CEFDHAC's Yaoundé-based secretariat provided by the IUCN (International Union for the Conservation of Nature), CEMAC (the Economic and Monetary Community of Central Africa) for financial matters, COMIFAC (Council of Ministers in charge of Central African forests) and REPOFBAC (the Congo Basin forestry policy network).

In most countries of the sub-region, forestry activities are primarily funded by governments, but also to some extent by the forest enterprises themselves. Revenue from the development of forest and wildlife resources has provided financing for special funds to develop the sector in some countries. These funds serve to underwrite management activities in forest reserves and protected areas, as in Cameroon, CAR and Congo. Though by no means an exhaustive list, we should mention significant national projects such as PARN, the World Bank's natural resource management project in CAR, Gabon's management-oriented project for the stratification, mapping, and multi-resource inventory of Forest Zone One, Gabon's PSFE (Projet sectoriel forêt/environnement), the PNADD (National plan for environment and sustainable development) in Equatorial Guinea, the Action Plan for the conservation and management of natural forests in the Zaire-Nile Crest in Rwanda prior to the tragic events of 1994, and the "Parks for Peace" project formulated in Burundi, Rwanda and the DRC with CEFDHAC support in the conflict-ridden frontier zones of these three countries, etc.

Concerning incentives, a number of benefits are extended to encourage sub-regional forestry enterprises to invest in the sector. These include tax exemptions and global reductions for the introduction of new equipment needed for timber production. Fiscal incentives to promote private sector forestry enterprise interest in the management and industrialization of national timber sectors are common.

1.2.5. Forest management trends

New alternatives are being explored to bypass state monopolization of sustainable forest utilization and conservation activities. These include furthering the democratic process, policy liberalization, newly-assumed responsibility on the part of local communities, and decentralization. This new state of affairs has considerable impact on official policy, including forest policy, as can be seen in recent policy reforms in selected Central African countries such as Cameroon, CAR, Congo, Equatorial Guinea and Rwanda. All converge in terms of issues linked to conservation, sustainable forest resource utilization, participatory management, the implementation of forest management operations, and the like. Concepts such as permanent and non-permanent forest domain, sustainable management, participatory management, safeguarding biodiversity, the certification of tropical timber and community forestry are now almost universally embodied in sub-regional forestry policies though, admittedly, the practical application of these revised policies does remain a problem.

1.2.6. Key issues and concerns

Deforestation (at an annual rate of 0.4 percent[4]), appears to be a rather secondary problem in Central Africa compared to deforestation rates in other African sub-regions. Burundi and Rwanda have far and away the highest rates of negative annual change in forest cover in Africa, or even in the world. Congo, CAR and Gabon, however, have annual rates of -0.1 percent. On the whole, in fact, Central African forests face a greater threat from forest degradation than from excessive deforestation, or at least this is true for the forest countries.

[4] FAO, 2001. Global Forest Resources Assessment 2000. Main report. FAO Forestry Paper 140. FAO, Rome. http//:www.fao.org/forestry/fo/fra/main/index.jsp

The threat takes the form of selective forest harvesting, commercial hunting for bushmeat, and armed conflict, especially in the Great Lakes countries. High population densities in some countries, such as Burundi, Chad, Rwanda and São Tomé, also foster acute competition between the forestry, agricultural and pastoral livestock sectors. These countries also face shortages of available land, a problem made all the more acute by the need to supply household energy requirements. As it happens, over 90 percent of the domestic energy requirement are supplied by wood from forests and woodlands, plus plant wastes. Nor are the forest countries exempt from such shortages. Generally speaking, the causes of deforestation are many and diverse. There are direct causes such as harvesting and urbanization, and indirect socioeconomic factors such poverty among local populations, international market fluctuations, and the like. The causes may also be policy-related -- the result of external adjustment programmes or poor management practices, for example. Moreover, some countries such as Chad, northern CAR, Burundi and Rwanda have endured years of exceptionally low rainfall and thus face an additional threat from desertification.

Poverty remains the fundamental problem. Except for Gabon, the Central African countries are some of the world's poorest. The massive amounts of displaced peoples engendered by armed conflicts are an additional aggravating factor. Of the region's eleven countries, six (Burundi, Chad, Congo, the DRC, Rwanda and Angola) are still working to establish political stability. Repeated armed conflicts in several countries have entailed considerable infrastructural breakdown and frequently irreversible environmental damage. This is further eroding the already precarious situation of local people, and destroying the administrative structures responsible for forestry, wildlife, and the overall protection of nature.

As for forestry policy, both the status of natural forests and the way they are managed suffer from a kind of fuzziness, due to cultural dualism and past policies. The legislation in virtually all Central African countries stipulates that the natural forests belong to the State. But in the customary view of things, these same forests also belong to members of the various tribal lineages. This fosters an overlay of different entitlements concerning the trees, the forests, and the land on which they grow.

Forest development is not sufficiently well-coordinated with either rural development or the actors involved in rural development. Local populations, NGOs, and the private sector lack sufficient say in forestry policy design, implementation and evaluation. The implementation of new projects often runs into problems generated by conflicts of interest. There is, nonetheless, an observable recent trend on the part of most of these countries towards decentralization of the responsibility for natural resource management, and the concomitant community or communal appropriation of forest lands.

Forest law is easily and frequently gotten around, or else is hard to enforce. Enforcement and monitoring problems in management programmes, including scarce forest service and agency staff, constitute major challenges to sustainable forest management at the country level, as do institutional weakness and instability, and the lack of training among staff working in this sector. Almost all institutions lack the material resources they need to perform their jobs properly. Lack of staff, material resources and training are also at the root of failures to maintain areas which have been, often at great expense, afforested. And from the regeneration standpoint, the current and already minimal reforestation programmes are on a downward curve.

As for conservation, protected areas in the sub-region have endured a variety of attacks from armed conflicts, poaching, incursions of migratory herds on the move to new pastures and carrying rinderpest, human settlement in protected areas, the fragmentation of natural ecosystems, the pillaging of natural resources, etc. Armed conflict has also brought ecotourism to an abrupt halt, along with losses of funding and the weakening of institutional capacity for these protected areas. There is a manifest willingness to expand the network of protected areas, as witnessed by the 1988 Lomé Declaration, the 1996 Brazzaville Declaration and the 1999 Yaoundé Declaration, but this has not as yet translated into action on the ground. Except for those sites managed with the aid of external funding, a great many protected areas are protected in name only, and have been abandoned to their own devices. Boundaries are often vague and buffer zones nonexistent, with uncontrolled resource exploitation extending into the very heart of the reserves.

We still do not know enough about the forest to ensure effective management and the various inventories which have been done often cover only a portion of productive forest lands (Cameroon, CAR, Congo, Gabon, Rwanda). At the country level, the data on forest cover are obsolete if not nonexistent and in need of revision to bring them up to date. Burundi's latest forest inventory dates from 1976 and the DRC's from 1982. The most recent country data are those from Equatorial Guinea from 1992.

2. COUNTRY STATUS REPORTS

2.1. Angola

2.1.1. Legal and institutional framework for sustainable forest management

Legal framework

Angola is probably the only African country having neither a forest code nor a legal framework for one. The current forestry legislation dates from colonial times. The forestry sector still makes use of the edict established by Decree Law n°44531 of 21 June 1962, which remains to this day the sole legal instrument covering forestry, wildlife and fisheries. The Decree does cover the use and harvesting of forest resources and wildlife, but makes no mention of management or silviculture, and its terms are vague and imprecise. It did undergo review in 1981-82 and in 1989, but is still poorly suited to the situation on the ground. Regulations governing natural resource conservation date back to 1977 with Decree Law n°43/77 of 5 May 1977 defining the various categories of protected areas.

Forestry and management institutions

Legislation enacted in 1992 (Law 21-C/92, the "land law") stipulates that natural forest cannot be held privately, except for small, designated agricultural and pastoral areas. All forest lands thus belong to the State of Angola, under the responsibility of the Ministry of Agriculture and Rural Development (*Ministerio da agricultura e do desenvolvimento rural* – MINADER) and more specifically the Forestry Development Institute (*Instituto de desenvolvimento florestal*), IDF, established in 1989 by Decree Law n°41/89 of 22 July 1989, and the National Directorate of Agriculture and Forestry (DNAF), established in the early 1990s. The DNAF also plays an important role in the Angolan forestry sector, formulating policy and advice on agricultural and forestry issues.

The IDF establishes the administrative set-up in each of the country's 18 administrative provinces and implements government policy, which is supposed to emanate from the DNAF. Under these terms of reference, the IDF is responsible for the definition, supervision and monitoring of legal procedures with reference to forest development, use, management and conservation, as well as protected area management. The IDF is made up of the departments of the forest, wildlife, inspection and monitoring, planning and studies, budget and accounting, and human resources.

Another government agency, SEA, the State Secretariat for the Environment, established in the early 1990s, is responsible for natural resource conservation and protection policies. It became the Ministry of Fisheries and Environment in 1998. Other institutions with environmental responsibilities are the National Directorate for Fisheries and Agriculture (DINOPA), the Institute for Agricultural Research and the Institute for Veterinary Research – both under MINADER and the National Department of Water Resources under the Ministry of Industry.

Enlisting the participation of other sectors in Angola's forestry sector development remains a major challenge for its forestry institutions. Private sector participation in forest management is quite weak and tends to focus on production activities rather than management.

There are quite a few national NGOs, but their work in the field is still very restricted. The *Associaçâo Angolana do ambiente*, an NGO established in the early 1980s, works to promote awareness of environmental issues. Angola has no forestry research or teaching institutes.

2.1.2. Status and trends in forest management

History of forest management and silviculture

The Portuguese colonial authorities earmarked for conservation a number of areas thought to offer little agricultural or economic potential. In Angola, government support for conservation efforts grew as interest in conservation quickened within the country, a trend that continued into the 1970s. The first major wildlife inventories also date from this same period.

Forest plantations were established during colonial times, especially during the 1960s and 1970s, mostly by the rail companies and paper-making firms. The wood from these plantations was used to produce firewood to fuel the locomotives and raw material for paper-making. This effort was paralleled by afforestation to produce fuelwood for local people and to protect the watersheds. After independence in 1975, most private plantations were abandoned following the decline of the paper industry and the use of other fuel sources to power the locomotives.

A number of institutions were active in natural resource management from 1955 to 1972. The Nature Conservation Council was set up in 1955 to act as an advisory committee in areas such as land use and the utilization of plant and animal wildlife. Nature conservation policy management was at that time under the Veterinary Services Division (parks and hunting) and the Agricultural Services Division (forests, inland waters and land). The *Repartiçâo técnica de protecçâo à fauna* under the veterinary service was directly responsible for wildlife conservation throughout the country, and also for management of Angola's national parks, reserves and controlled hunting areas. In September 1969, the *Liga para a protecçâo da natureza* was set up to improve natural resource protection. As of 1972, management became the sole responsibility of the *Reparticçâo técnica* (Decree Law n°22/72 *dos Parques nacionais* of 22 February 1972). The National Directorate for the Conservation of Nature (*Direcçâo nacional da canservaçâo da natureza*, DNACO), established in 1977 with Decree Law n° 43/77 subsequently assumed these management responsibilities.

Wood production began to decline after 1975. The forestry sector has been greatly affected by the (still ongoing) civil war which broke out in 1976. Almost all processing plants have been destroyed, with the worst damage occurring during the latest phase of the war.

Despite this, a forest plantation programme with public participation, designed to supply fuelwood and other products, was launched in the early 1980s, but the programme was soon abandoned for various reasons including lack of maintenance. The civil war made it impossible to maintain these plantations, though the need for fuelwood and timber continued to grow. In 1986, a forestry planning support project was formulated with UNDP (United Nations Development Programme) and FAO assistance to define a sound sectorial policy and identify priority action targets. A 1989 plan to plant 250 000 trees to provide shade for crops and protect soils from erosion was also formulated, but never implemented.

In the early 1990s, Angola changed over from the centrally planned economic system introduced after independence to a free-market system. And once the civil war had subsided in 1991, new conservation programmes were launched in the country. The desertification control project in Tombua in the early 1990s and the reforestation programme launched by the IDF in 1993 to rehabilitate degraded forest areas are two examples. The National Forests Action Plan was finalized in 1994. But the social and political situation took a turn for the worse in 1998 with the resumption of the war. The central plateau is the main theatre of operations, but few areas of the country have managed to escape unscathed. The forest plantation programme and the forestry sector as a whole are at a complete standstill, and the rate of reforestation is virtually nil for lack of resources and infrastructure and the persistence of security problems.

Criteria and indicators for sustainable forest management

NO AVAILABLE DATA.

Current practices for sustainable forest management

Management objectives

An estimated 70 million ha were under forests in 2000, mainly in the northern part of the country. Some 24 million hectares of productive forest (or classified as such), are also found in the same area. Plantations, mostly established by the private sector under the colonial administration, cover some 140 000 hectares. There are about 8 million hectares of protected areas.

Forest management plans

No forest management plans have been developed or implemented in the country, either inside or outside the protected areas.

Silviculture

The main plantation species are *Eucalyptus* spp.(comprising 80 percent of the plantations), *Pinus* spp. and *Cupressus lusitanica*. Angola is the only country in Africa with such extensive *Eucalyptus* plantations. These plantations, public and private alike, as well as the natural forests, totally lack any sort of management plan or silvicultural treatments and are in all likelihood highly degraded for a great many reasons, most having to do with the civil war.

Forest conservation measures
The first mention of national parks and reserves dates back to 1936. The first national park, the *Parque nacional de Caça do Iona*, was established in 1937. Decree Law n°40/040 of 20 January 1955 featured the first conservation legislation, covering all aspects of conservation, wildlife utilization and hunting, plus the establishment of national parks, reserves and hunting areas. It also set up a Council for the Conservation of Nature (*conselho de protecçâo de natureza*), which issued regulations governing the national parks.

Protected area legislation dates from 1972. Decree Law n°43/77 of 5 May 1977 defined the categories of protected area. These included six national parks covering an area of 5 423 000 hectares, two strict nature reserves covering 828 000 hectares, four partial reserves covering 1 920 000 hectares, and one regional nature park of 10 000 hectares. Legally established protected areas today cover an area of some 8 million hectares, including nearly one million ha of forest, or 6.6 percent of the total land area. There are also 18 forest reserves covering about 18 560 km², though these have received little attention since their establishment.

Forest protection measures
NO AVAILABLE DATA.

Forest harvesting practices
Forest harvesting is based on a system of concessions granted for a limited period of time. Most concessionaires are private logging companies. Harvesting is selective and the main target species include *Guilbourtia coleosperma, Marquesia macroura, Berlinia* spp. and *Baikiaea plurijuga.*

Public participation in forest management
Community participation in forest management is still embryonic in Angola. Indeed, there is very little participation on the part of the populace, nor do they share in the benefits. Rural communities are attempting to respond to government appeals to plant trees. The management aspects, however, are receiving very little attention from the competent government authorities. The participatory approach is thus an important potential tool, which the sector should develop in the near future. A major constraint to public participation in forest development efforts has to do with forest ownership patterns. Communities are in fact living on land belonging to the State, with no formally defined terms of usufruct. This legal framework is now in the process of adaptation under draft decree n°21.C/92.

Special programme and incentives to promote sustainable forest management

There are relatively few incentives to promote the conservation and management of forest resources, due to the war which has gone on now for several decades. The Forest Action Plan was, however, finalized in 1994 with support from the World Bank. There is also an elephant conservation plan with a five-year, three-stage programme. Its objectives are conservation and management infrastructural improvement for protected areas, capacity-building for conservation structures, conservation monitoring and research systems, environmental awareness-building, better environmental legislation and policy, and an integrated conservation and development programme.

Action to achieve these objectives will include the establishment of a working network of protected areas, including the designation of multi-use zones, the establishment of a state wildlife and conservation authority, non-governmental conservation agencies, the introduction of a national conservation and development strategy, the development of a national environmental policy and formulation of the appropriate legislation to achieve these goals. There is no available data on the implementation of these efforts.

Trends in forest management

The National Forests Action Plan finalized in 1994 set forth the priority principles of the Angolan forestry sector. These include institution-building, reforestation and natural resource management, the establishment of an environmental conservation strategy, and improved use of forest products. Another important objective is to implement a participatory process whereby forest users have a say in decision-making for this sector. There is no available data on the introduction of these priorities.

Key issues and concerns

Forestry activities in Angola are in a virtual state of paralysis due to the civil war which has persisted for several decades. The forestry sector has been severely affected, and timber production has dropped off considerably since war broke out in 1975. All forest industries have been destroyed. The war is not the only factor affecting wood production. Even prior to its outbreak there was a notable lack of expertise and considerable wastage due to poor harvesting and processing practices. In the mid-1990s, some forest enterprises tried to continue production activities, but the war made this impossible. The forest sector in Angola has been in a state of virtual neglect throughout the last two or even three decades, due to the war. The upshot of this neglect has been severe forest resource degradation due to overexploitation of the natural growth, and a major crisis in the forest products needed by the population. The fact is that while levels of forest harvesting remained fairly low during the war years, exploitation was and is wholly uncontrolled.

The annual rate of deforestation is estimated at - 0.2 percent for the 1990s, mainly due to removals of wood and non-wood forest products to meet the basic needs of the population, especially for fuelwood, the main source of energy in rural as in urban areas. The forest is the prime source of revenue for many rural families, especially those engaged in charcoal-making. The expansion of slash-and-burn cultivation has also caused widespread devastation of forest cover. In addition, small-scale agriculture, the most common form, suffers from inadequate land classification, forcing rural dwellers onto marginal land to meet their household needs and grow a few cash crops to provide a little monetary income. Even greater degradation is wreaked around the main towns by urban dwellers attempting to meet their fuelwood needs and planting subsistence crops near urban areas. A great many present-day urban dwellers are also displaced persons from rural areas who were pushed out of their homes in the countryside by the war.

What we are now seeing is intensified land use in newly-settled areas of population aggregation. These migrations have also heightened land use conflicts. The problem of desertification, particularly in southern Angola, is a further aggravating factor.

Forest plantations might be able to compensate somewhat for the impact of forest degradation and deforestation, but plantations remain unfortunately undeveloped, and the lack of silvicultural treatments and management plans mean that the plantations are, by and large, degraded as well. Chronic short-staffing in the forest service translates into lack of monitoring on the ground, further accentuating the problem.

Major constraints in the forestry sector include the lack of appropriate forestry legislation for sustainable forest management and forestry sector administration. There are no funds to implement much-needed development programmes, trained staff are lacking at every level, there is no operational forest management plan, inter-institutional cooperation among the agencies responsible for natural resource management and administration is poor. And, of course, the chronic state of political instability has a very negative impact on the development of Angola's main economic sectors.

The IDF is representative and does a good job, but is forced to contend with a raft of socioeconomic problems. Administrative and professional staff are far too few in number to perform their planning and management duties as they should, not to mention coping with the day-to-day organizational matters of the forest sector. The sector is extremely short of the equipment and funds needed for programme and project implementation. No forest management plan is operational on the ground, and therefore the present state of conservation of natural and artificial forests remains highly critical. And the highly important participation of private sector partners in forest management is severely hampered by factors such as the unsatisfactory forest policy still in place, especially with respect to land tenure.

National environmental policy and legislation also fall short of the mark. Protected area classifications quite fail to meet international classification standards, and virtually all of Angola's parks and reserves are in a state of total neglect. The entire parks system has in fact been placed on the list of war-endangered protected areas since 1988, due to the severe management gap in the wake of civil war, unauthorized incursions of local populations, and the lack of infrastructure. This is aggravated by the paucity of staff, resources and support. It is hard to describe the current state of protected areas with any degree of exactitude. The same must also be said of unprotected forest areas, since there has been no forest inventory or substantial field study to evaluate the current state of forest resources. What data we do have is old, partial and obsolete.

Peace and stability thus continue to the decisive factors upon which the successful development of the forestry sector will hinge, and this is especially true of sustainable forest management.

2.2. Burundi

2.2.1. Legal and institutional framework for sustainable forest management

Legal framework

Law n°1-02 of 25 March 1985 defines the forest domain, and contains all provisions concerning forest reserves, protection forests and the protection of mountain lands, such as restricted grazing areas and the establishment of soil protection schemes. Lastly, it regulates the establishment of afforestation programmes to improve and safeguard the production of forest species reproductive material, and monitor its introduction.

Land resources are mainly governed by the land code of 1986 (Law n°1/008 of 1 September 1986) which sets forth the rules applicable to recognized rights over all state-owned and non state-owned land throughout the territory of Burundi. Concerning environmental protection and conservation, Decree Law n°1/06 of 3 March 1980 covers the establishment of national parks and nature reserves, whereas Decree law n°100/47 concerns the establishment and organization of the National Institute for the Conservation of Nature (INCN), which became the National Institute for Nature Conservation and Environment (INECN) with Decree n°100/188 of 5 October 1989. There is also an environmental code, a national strategy of environment and its action plan (SNEB-PAE) as well as a national strategy for biodiversity conservation and its action plan.

Forest institutions and forest managers

Natural forests are legally classified as public domain whereas afforested areas may be privately, communally or state-owned. Domain lands are classified as within the public domain (such as naturally regenerated lands), or as private state-owned land (such as state-owned afforested areas), or as land belonging to communities, or public establishments or public companies. Non-state lands belong to their owners in accordance with customary usage rights. The (alienable) private land belonging to the State may be legally ceded or granted on a concessionary basis (with or without charge) by the competent authorities and in accordance with their area and classification as rural or urban.

In 1988, the Government established the Ministry of Territorial Development, Environment and Tourism (MINATE). One of its prime missions is to safeguard natural resources and the environment by planning, coordinating, executing and monitoring environmentally-linked programmes. Decree Law n°100/010 on the organizational aspects of this Ministry dates from 16 January 1989. Afforestation and agroforestry are managed by the Forest Service under the General Directorate of Territorial Planning and Environment, and is primarily responsible for coordinating the execution of government policy on forest resource management and development, and for rational forest management. The Ministry is also responsible for the National Institute for Nature Conservation and Environment (INECN) in accordance with Decree Law n°100/188 of 5 October 1989 concerning INECN’s organization. The Institute is responsible for managing natural forests and protected areas for nature conservation and environmental protection.

Local NGOs have been very active since the 1980s in support of the Burundi government's environmental management efforts, intensifying the motivational aspect of rural development programmes so as to encourage people's participation in their own development.

2.2.2. Status and trends in forest management

History of forest management and silviculture

The history of artificial forests dates back to the early twentieth century. Meeting fuelwood needs goes back to 1919. In colonial times, the first plantations fostered the protection of natural forests while supplying the fuelwood earlier cut in the natural forests, and offering a means of protecting farmland from erosion. Tree-planting at that time consisted of rows of roadside trees plus some community woodlots. The establishment of community woodlots was made compulsory in 1931. The colonial era was accordingly marked by a certain awareness of the need to protect and restrict access to the natural forests, and to develop forest resources through reforestation, and not solely by restrictive measures on the part of the colonial authorities.

By 1948, dwindling natural forest resources prompted the authorities to set up a service primarily responsible for preserving natural forests and managing economically-oriented afforested areas. These plantations, established under the colonial powers, ran into management problems after independence. The peasants tried to appropriate part of the afforested areas, and the State was not enforcing the law that would have ensured their protection. Reforestation efforts also declined after independence. As wood became scarce in the late 1960s, the Government acted to define a clear forestry policy. By 1969, a forestry sector development white paper was ready. By the late 1970s, Burundi had become sensitive to the problem of conservation, and measures were enacted to stabilize the boundaries of forest reserves and to protect them from the amputations then practiced by people clearing the forest. A vast afforestation programme was launched in 1978 by the Government of Burundi with the support of external donors. The objective of this programme was to restore tree cover over 20 percent of the national territory.

The 1980s were marked by renewed official efforts in forest conservation and rehabilitation. The authorities became concerned with rational natural resource management. There had been no legislation on protected areas prior to 1980. Decree Law n°1/6 of 3 March 1980 established the national parks and nature reserves. The 1982 Forest Symposium, the second following the 1973 Symposium, set the following targets: private tree-planting at a rate of 300 trees/household (roughly 200 000 ha of family woodlots), 300 000 hectares to be afforested, 41 000 hectares of protected moist montane forest and 15 000 hectares of protected wooded savannah, a total of 580 000 hectares, or 20 percent of the national territory. By the close of the 1980s, the forestry sector had made substantial progress in involving local people in these forestry development activities. The participatory approach was taken as a model to give local people the incentive to participate actively in these field efforts and at the same time meet their own needs for food, fuel and other items. A set of laws were also adopted (despite their numerous inherent legislative gaps), primarily the 1985 forest code and the 1986 land law.

The forest code abrogated all prior and conflicting legislation, especially the decree of 18 December 1930 covering the cutting and sale of wood, the law of 23 January 1962 concerning compulsory community reforestation, Decree Law n°1-22 of 31 July 1978 concerning reforestation schemes, the 24 July 1979 Decree Law on soil protection and rehabilitation and Ordinance n°53/5 of 9 April 1915 on the conservation of forest species.

Communal- and state-afforested areas covered some 95 000 hectares in 1992, and total forest cover had attained some 210 000 hectares, or nearly eight percent of the national territory. Since October 1993, the Burundi forestry sector has had to cope with a violent civil war, widespread unauthorized cutting and wildfires. Major population displacements and loss of life have occurred, and the northern part of the country has had to absorb the influx of refugees from Rwanda which began in 1994. Forest cover is now estimated at 94 000 hectares, of which 73 000 hectares constitute artificial forests.

Criteria and indicators for sustainable forest management

NO AVAILABLE DATA

Current practices for sustainable forest management

Management objectives

In the wake of the 1993 crisis and the ensuing heavy forest losses, the ongoing silvicultural programme has as its goal to restore tree cover over 20 percent of the national territory. The current priority, above and beyond forest management, is to meet the growing need of the people of Burundi for fuelwood, charcoal and timber.

Forest management plans

As for forest harvesting, the management of all state forests and afforested areas is regulated by forest law. Harvesting is permitted either under government supervision by the forest services or by private parties. The code calls for public announcements of sales of standing volumes, specifies the concession subdivision to be cut, organizes the marking of reserved trees and supervises harvesting and other operations. Wooded areas greater than 10 hectares in size belonging in the private sector or to public companies are managed according to plans agreed with the administration.

Silviculture

Eucalyptus species are found in almost all plantations (some 35 percent of the total area), followed by *Callitris* spp. at 33 percent. Other species of Conifers, such as *Pinu*s spp., which cover 16 percent of the total planted area, are also present. Other main species planted are *Grevillea* spp. and *Cupressus* spp.

In the (private) agroforestry sector, *Grevillea robusta*, *Calliandra* spp., *Leucaena* spp., *Cedrella* spp. and *Markhamia* spp., are among the main species planted. A number of planting techniques have been tested, especially for afforesting grazing lands or land unsuitable for cultivation, on cleared hilly land and steep slopes, and, lastly, on fallow land, for production and/or protection. Plants are produced by the administration and distributed freely to the farmers.

Forest conservation measures
The first decree law authorizing the establishment of national parks and nature reserves in Burundi was passed in 1980. Decree law n°1/06 of 3 March 1980 established national parks and nature reserves. Decree law n°100/47 of 3 March 1980 set up the National Institute for the Conservation of Nature (INCN) (which became the INECN in 1989), and was mainly responsible for safeguarding existing natural formations. This legislation excluded the people whose homes bordered on these areas, in contrast to a more participatory approach involving decentralized management. At that time, two national parks, two nature reserves, three forest reserves and two national monuments were proposed. Protected areas were established in 1982, with conservation efforts centered on Kibira National Park and the Buriri Forest Reserve, plus several other non-wooded protected areas. In 1983, a management plan was formulated for Bururi, under the leadership of the National Institute for Nature Conservation and Environment (INECN).

A draft framework law for the environment, called the Burundi National Environmental Strategy (BNES), and the Environmental Action Plan (EAP) were drawn up in 1992-93 but the basic situation on the ground was radically altered by the October 1993 emergency. Despite this, the BNES – EAP was updated in 1997. An environmental law is already on hand. These two legislative texts will make it possible to harmonize and fill in the gaps in existing legislation. Protected areas covered a total of 146 000 hectares in 1997, including 43 600 hectares of forest.

Forest protection measures
Over 4 000 hectares of woodland were devastated by brushfires in 1998. The critical time comes at the end of the dry season, in September. Grazing-lands are traditionally regenerated by fire at this time of the year.

As for protection, the Forest Law in force bans clearing in state forests and afforested areas, and stipulates rules for permissible clearing in communal or private forests. There are three categories of fire: prescribed burning of crop residues, burning grazing-lands, and brushfires. The conditions for the first two are specified for each category, including the terms, dates, authorizations and sanctions. Concerning infractions, the code spells out the role of the forest service in any disputes arising, and the service is specifically authorized to take action, before or after rulings. Over 300 kilometers of firebreaks have been established on protected forest areas, but regular upkeep has lagged for lack of financial resources.

Forest harvesting practices
Precious wood species most in demand include *Entandrophragma excelsum, Podocarpus milanjianus, Podocarpus usambarensis, Prunus africana, Symphonia globulifera* and *Pericorpis angolensis.* Harvesting the natural forests is now prohibited because they are protected.

Public participation in forest management
The legislation governing forest management has suffered from a perennial lack of coherence. Nor has it been appropriate, with forest law even now lacking the necessary tools for supervision and for prosecuting infractions. In the sustainable management of forest ecosystems, the restrictive is favored over the participatory approach. But the outcome has shown, especially since the 1993 emergency, that people fail to grasp the interest of this formal ban on the exploitation of forestry formations, which utterly ignores their own interests. Communal management of forest resources should be a concern shared by the state services, the rural people who are the direct beneficiaries of these resources, and all partners in development. The legislation also sidelines people whose home border on protected areas, giving no weight to public participation and decentralized management. Indeed, there has so far been no effective public participation in matters concerning natural resource use and the environment. Pilot projects of participatory management of the state-owned forests are on their way in two provinces in the North of the country.

Despite this, public participation in agroforestry and afforestation since the 1980s has been quite striking. The Government of Burundi made a point of enlisting local communities and private citizens in the afforestation effort. At that time, most of the active forest projects had an agroforestry component. Using agroforestry seedlings, most distributed free of charge, farmers increased the number of trees grown in association with crops and also established mini-woodlots of *Eucalyptus* spp. Today these mini-woodlots and agroforestry areas cover more than 60 000 hectares, based on the number of seedlings distributed each year. The most popular agroforestry species to date is *Grevillea robusta*, followed by the exotics *Calliandra, Leucaena* and *Cedrella*, and the native *Markhamia* and *Ficus* spp. Forest nursery efforts were mainly state-subsidized, with the community agreeing to contribute work in the communal afforested areas.

Special programmes and incentives to promote sustainable forest management

The Government, with a view to meeting the growing need for wood and easing pressure on natural forests, made a point of enlisting local communities and private citizens in reforestation efforts. A Forest Symposium was held in January 1982 to devise strategies for subsequent implementation, including the promotion of community and private afforestation efforts, The gradual de-linking of the State is a necessary component of afforestation, and so is making local people aware of the need for reforestation and forest protection.

National Arbor Day was inaugurated in 1979. The system whereby forest and agroforestry seedlings were distributed free of charge eventually gave way to subsidized sales. In the 1990s a strategy was devised to help private citizens establish their own nurseries. Motivational sessions were organized for local people. The involvement of schools, missions, cooperatives and integrated development farm centres had a positive impact on the development of private forestry. Though many projects were halted in the wake of the emergency, the Forest Service nonetheless continued to produce forest and agroforestry seedlings, and a number of forestry projects have been implemented in recent years, primarily reforestation efforts such as the Bukirasazi Project. The Government of Burundi received UNDP support in 1998 to rehabilitate environmental management.

A UNDP-financed, FAO-executed project for environmental rehabilitation and management launched in 1998 is now underway. The project supports MINATE's efforts to restore national forest cover through the Forest Service.

Though the crisis is not yet quite over, work is already being done to restore the forest cover lost during the emergency period. Some 2 300 hectares have just been afforested in the northern part of the country. Strategies include motivating the public to participate in forest development and protection -- especially protection against forest fires, promoting agroforestry, private sector reforestation and the protection of denuded crests through reforestation.

Trends in forest management

In the wake of the events of 1993, forestry policy needed to be updated to fit the new set of circumstances. Four major policy thrusts emerged: the development of forest resources and rehabilitation of forest cover destroyed during the emergency, reinforcing the concerted management of existing forest resources in line with the situation on the ground, improved technologies to boost the value of wood, and implementing a research support programme. Reinforcing forest management also demands effective public participation in the management of state-afforested areas, ensuring people get a fair share of the fruits of their work. Mindful of the prevailing state of crisis in recent years, however, it is important to note that the overall situation in general and forest management in particular have worsened. And given the still ongoing state of political instability, it is really not possible to say to just what extent things have gotten worse.

Key issues and concerns

Forest cover in Burundi was already under threat from the pressure of rapid demographic growth even prior to the 1993 emergency. Population displacements due to war in Rwanda and Burundi served to exacerbate an already critical situation. The entire forestry sector in Burundi was thrown into disarray by the emergency. Natural and artificial forests were destroyed through forest clearing, unauthorized cutting, and brushfires. Forest resource degradation is also caused by the growing public need for fuelwood and service wood and the search for (increasingly scarce) land suitable for farming. Burundi is now deficit in both fuelwood and service wood. But studies are still necessary to assess the extent.

Due to the foregoing, there are not enough resources to ensure good forest resource management. Generally speaking, the Burundi forestry sector faces a raft of technical, social and economic problems. The legal instruments are not adapted to present-day requirements and should be modernized – the forest code dates back to 1985 and the land law to 1986. Human, material and financial resources are insufficient to cope with the current need to expand and develop Burundi's forest resources. Nor is enough known about either the forest resource situation or the real needs of the population. The latest forest inventory took place in 1976. All this coupled with the quantitative and qualitative gaps in staff and financial resources conspire with other factors to ensure that the scant resources available are poorly managed as well. The lack of a management plan for state- and community-owned wooded areas is another gap.

Concerning conservation, all major stands of montane and remnant forests are located in already established conservation areas. The key issues and concerns remaining today concern planning and management. The legislation on forest conservation is appropriate, but the ways and means to effectively implement these rules are not. Institutional capacity is severely curtailed by the lack of trained staff and the instability of the national political context. Training initiatives are lacking. External assistance would be essential to manage the reserves. The national services responsible for the conservation and sustainable management of biological diversity also face enormous difficulties due to the lack of security, population displacements, scarce funding and the halt in cooperation programmes.

2.3. Cameroon

2.3.1. Legal and institutional framework for sustainable forest management

Legal framework

Law n°94/01 of 20/01/94 on forests, wildlife and fisheries codifies forestry, wildlife and fisheries policy, and specifies the means of policy implementation. The legal texts for application of the law are Decree Law n°95/466 of 20 07/95, on wildlife, and Decree Law n°95/531 of 23/08/95 on the forest. Law n°96/12 of 05/08/96 covers the environment and there is no specific legislation on its implementation. Cameroon's new forestry policy embodies Cameroon's and the international community's concern for nature conservation, reflecting now universal notions on development and environment. There are five major policy thrusts: protect forest resources and help put biodiversity conservation and environmental protection on a permanent footing; boost public participation in forest resource conservation and management to help people raise their living standards; develop forest resources for enhanced forest sector contribution to GDP; ensure resource renewal through regeneration and reforestation to ensure lasting forest production potential; and, vitalize the forest sector through the establishment of effective institutions, enlisting the full participation of all stakeholders in forest and environmental management. The policy also includes innovations designed to enhance sustainable forest resource development. These include the establishment of a forest development fund, decentralized forest management, enhanced protection of forest ecosystems and wildlife habitats, support measures to maintain and augment the national presence in forest industries, the financing of forest development activities through programmes, differentiated management, permanent forests and multi-use forests, resource removals tailored to forest potential, greater concern for protection of plant cover with the introduction of the classification of ecologically fragile zones, and, lastly, enhancing the value of other forest products.

Forest institutions and forest managers

Most forest land belongs to the State. The forest zoning plan for the southern part of the country subdivided some 14 million hectares into permanent forest domain (nearly 9 million ha of classified forests or forests slated for classification) and non-permanent forest domain (referred to as the "agro-forestry strip") comprising some 5 million hectares. The permanent forest is mainly state-owned (private state forests, production forests, protection forests, etc.) and communal forests (privately owned by the community, some 250 000 ha). The non-permanent forest comprises a multi-use area of forest lands which may be used for purposes other than forestry, and includes community and other forests, such as privately owned forests, agroforestry areas, and so forth.

There are six management categories: the governmental sector, the national forestry development service (ONADEF), the private sector, the communal sector, the village communities and private individuals.

The Ministry of Environment and Forests (MINEF) is primarily responsible for policy formulation and implementation. A parastatal agency under MINEF, ONADEF, is responsible for forest inventories, forest management, reforestation, wood promotion and desertification control. ONADEF also has a remote sensing and forest-mapping centre. Industrial harvesting is managed by MINEF's Directorate of Forests, with a sub-directorate (SDIAF) responsible for forest management and inventories, and a community forest unit with comparable terms of reference for community forests: MINEF also has a Directorate of Wildlife and Protected Areas for protected area management

Other ministries whose work has links with forest management include the Ministry of Trade and Industrial Development (MINDIC) in charge of forest industries. The Ministry of Scientific and Technical Research (MINREST) works with MINEF on the orientations and agenda of forest research through the Institute of Agricultural Research for Development (IRAD), which also does forestry research. About 100 NGOs are now working in Cameroon. There are several training centres, primarily the University of Dschang and the Garoua Wildlife School. The private sector is equally active, with the main European groups present on the ground being Rougier, FITCAM, SIBAF, KIEFFER and others.

2.3.2. Status and trends in forest management

History of forest management and silviculture

Forest harvesting in Cameroon began around the end of the nineteenth century, and it is likely that the first silvicultural trials also date from that time. It had been decided from the outset that loggers should plant from three to ten seedlings of the same species for each tree logged. This procedure was soon abandoned, as it proved almost impossible to monitor operations in these vast tracts of forest. The first tree-planting operations in Cameroon date back to 1935, covering several thousand ha. Silvicultural trials involving thinning natural forests were undertaken at the same time. In 1947, after World War Two, natural regeneration was practiced anew in Cameroon in the forest areas of some regions, only to be supplanted in the early 1960s by plantations, the results from natural regeneration having proved unimpressive. The natural regeneration technique in use at that time was confined to simple operations of vine clearing, devitalization, and release clearing around regenerated trees. These practices had virtually disappeared by 1960-1980.

Savannah plantation programmes for fuelwood and service wood production and windbreaks for soil conservation and crop protection were successfully implemented after World War Two. From 1946-1957, tree-planting schemes for soil rehabilitation were also introduced in the Mokolo and Yagoua regions. The establishment of the National Forestry and Fisheries Fund in 1965 gave new impetus to tree-planting schemes, and new reforestation projects were launched. The number of savannah reforestation sites, mostly involving eucalyptus, has increased in recent years, thanks mainly to new financing sources like “Green Sahel”.

Forest legislative texts have been periodically updated since colonial times to bring them in line with new technical concepts and policy orientations in forest ecosystem management. In 1973, for example, Ordinance n°73-18 of 22 May 1973 established the national forest regime, later modified by Law 81-13 of 27 November 1981. From the late 1970s to the early 1980s, the notion of customary ownership by traditional communities made its appearance, along with concerted management rules involving several partners. The earlier 1981 legislation on forests, wild life and fisheries already contained a number of forest conservation provisions such as the minimum legal harvest diameter, and the protection of seed trees, which led to the conservation of most high-grade species and forest categories. Cameroon also embarked on a major reconnaissance and forest inventory effort. In 1987, the Tropical Forests Action Plan did a review of the forest sector, proposing a series of actions in the form of projects targeted at forest ecosystems and the implementation of economic recovery policies through forestry sector objectives. In 1988, a national workshop on desertification recommended the formulation of a national action plan to combat desertification (PALCD). ONADEF was established in 1990, supplanting the National Forest Regeneration Service (ONAREF) and the National Centre for Forest Development (CENADEFOR).

Forest management decision-making centres were characteristically dispersed, however, until the year 1992. The forest, including the sector concerning wood and other forest products, came under the Ministry of Agriculture, and wildlife under the department in charge of tourism. This situation was regularized in 1992 with the establishment of the Ministry of Environment and Forests. In 1993, a zoning plan for forests in southern Cameroon featuring participatory approaches was launched, with forestry policy implemented in accordance with Decree Law n°95/678 PM of 18 December 1995 institutionalizing the zoning plan. The new forest law of 20 January 1994 focussed on forest management and nature conservation. It embodied now widely accepted development and environmental concepts such as involving NGOs, the private sector, village communities and other stakeholders. Indeed, the new law on forest, wildlife and fisheries recognizes the rights of indigenous populations and calls for the introduction of preemptive rights over community forest, with various entitlements written into concession deeds. In 1995, new ways and means of applying the forest law were enacted, Cameroon ratified the United Nations Convention on Desertification and the National Forests Action Plan led to the identification of close to 100 projects whose execution will contribute to the implementation of forestry policy. The Framework Law on Environmental Management was passed in 1996.

The establishment and management of community forests by local people has received considerable impetus lately with the growing involvement of various private companies in the work of forest inventories and management. Several standards and procedures handbooks have been published as field guides for mapping, remote sensing, field surveys and compilation, along with survey, management and harvesting inventories.

Criteria and indicators for sustainable forest management

Cameroon already possesses most of the necessary forest management tools. It does, however, lack an instrument for management evaluation. To remedy this, CIFOR (International Centre for Forestry Research) and ONADEF undertook a joint Criteria and Indicators (C&I) test at FMU level in Kribi in the Tropenbos project area in 1996. The point of this test was to devise a simple, effective, inexpensive method for further tests with multidisciplinary teams. Other tests were later done to determine social management criteria. A total of 220 C & I were evaluated based on the ATO and CIFOR proposals, a group of C&I which compiled data from other sources such as FSC, ITTO, and the Montreal Initiative, plus those produced by a Dutch working party on sustainable forest management. The test received support from ATO and the international community.

CIFOR has recently preipared a “Tool Box” of C&I to be tested on several sites in Cameroon under a “co-management system” designed to adapt C&I to local situations. Recently Project PD 23/99 Rev. 1 (F) (ITTO/ONADEF) on the revised ITTO C&I Application Test set out to test and adapt these C&I to local conditions, at the country and FMU levels. It also aims to disseminate a set of ITTO-designed C&I tailored especially to Cameroon.

Current practices for sustainable forest management

Management objectives
Cameroon’s forestry policy objectives aim to “achieve sustainable development of the economic, ecological and social functions of the forest in a context of integrated, participatory management so as to ensure sustained and sustainable conservation and use of forest resources and ecosystems”. Forest management in the permanent state-owned forests is based on retaining forest cover over at least 30 percent of Cameroon’s territory in areas representative of the country’s biodiversity and comprising forest stands where uses and management procedures follow specific management plans. The non-permanent forest areas are favored for community forestry, mindful of the needs of local forest dwellers. Given the current size of farming enterprises and the rate of population growth, the areas allocated to those whose homes border on the great national forest stands, in the so-called multi-use areas, cover some 4 million hectares. These areas are meant to cover the public need for land up to the year 2020. Protected areas cover a little over 2 million hectares, and production forests some 6 million hectares.

Forest management plans
Excepting the national forests, all other categories of forest come under management or simple management plans. The Special Forest Development Fund (FSDF) has been set up to “ensure the financing of operations for the management, conservation and sustainable development of forest resources”.

The production forests in the permanent forest domain are subdivided into Forest Management Units (FMU) not exceeding 200 000 hectares, the basic logging concession size. The concessions consist of one or more FMUs. Management design and implementation are the responsibility of the concessionaire under state supervision. A number of instruments for this purpose have been available for at least a decade. Prepared by ONADEF, they include the "Guide to the preparation of production forest management plans in the permanent forest domain of the Republic of Cameroon" (1998). FMUs are allocated by tender following an invitation to tender. Bids are submitted to MINEF, which awards the FMU on the advice of a technical commission to review bids in accordance with the criteria of the law on implementation. Allocation of the FMU requires a security deposit within 45 days at the latest by the winner of the bid, and prior to signing the three-year provisional contract with the State. During the period of the provisional contract, the forest service allows the logging company a subdivision within the concession to be cut that year and not exceeding 2 500 hectares to allow the company to remain active while it works out a management plan. Providing the clauses of the provisional agreement are respected, the firm is allowed to sign a renewable, fifteen-year contract. The management does not simply spell out the rules for forest harvesting, processing and regeneration. It also covers measures designed to benefit the local population. Every year, a one-year plan of operations consonant with the management plan must be submitted for approval to the forest service. Private forest concessionaires/logging companies thus participate directly in the three stages of forest management: inventory, formulation of the management plan proper, and its implementation.

Production forests under FMUs in 2001 covered an area of over 3.8 million hectares, only 200 000 hectares of which comprised pilot projects submitted at the same time as the management plans approved by the forest service (i.e. 11 management plans for 11 FMUs). Others are in the planning or final stages.

As for the village community forests, the forest service decides on and approves all community forest management plans and simple management plans and assists private citizens in the formulation and implementation of these simple plans. Communities are entitled to request technical assistance free of charge from the forest service to manage forest resources contracted to them by the State upon request. Technical supervision is also provided. Private individuals are also required to draw up and implement simple management plans, also with assistance and technical supervision from the forest service.

Management plans for protected areas are prepared in accordance with MINEF's "national directives for the sustainable management of Cameroon's natural forests" (1998), and "rendered executive" by the Ministry. Nonetheless, these on-the-ground protected area management plans are only at the proposal or pipeline stage for a few areas with conservation/development projects.

Silviculture

A number of reforestation and/or natural regeneration approaches have been adopted in Cameroon, though natural regeneration techniques have virtually been abandoned since the 1960s.

Two procedures for enriching natural forests through tree-planting have been used in Cameroon: the strip method and parcels. The strip technique was introduced in Mbalmayo over 60 years ago. The main species were ayous (*Triplochiton scleroxylon*), mahogany (*Khaya ivorensis*), sapelli (*Entandrophragma cylindricum*) and bibolo (*Lovoa trichiloides*). The parcel procedure was based on the conventional notion of "support points", average-sized plots of 10 m x 20 m distributed in accordance with a square mesh of roughly 100 meters. After harvesting, the plots are planted with commercial species. Between the plots, forest height is brought down to 15-20 meters by devitalization.

Two methods were used for full planting in rainforest areas: regrowth and planting in full sunlight. The first was designed by the CTFT (Tropical Forest Technical Centre) after an experimental trial in Gabon. It has been used for over 40 years in Cameroon in rainforest areas, where the following species were widely planted: bibolo (*Lovea trichilioides*), bubinga (*Guibourtia* spp.), bossé (*Mansonia altissima*), framiré (*Terminalia ivorensis*), ngollon (*Khaya* spp.), sapelli (*Entandrophragma cylindricum*), okoumé (*Aucoumea klaineana*), ayous (*Triplochiton scleroxylon*), assamela (*Pericopsis elata*), teak (*Tectona grandis*) and moabi (*Baillonnela toxisperma*). Planting in full sunlight is used both in rainforest and sudano-sahelian zones. It can be wholly or partly mechanized, or else manual, and has long been virtually the only technique in use in the sudano-sahelian and most savannah areas of Cameroon, where the species most often planted are *Eucalyptus* spp., *Pinus* spp., *Cassia siamea*, *Acacia* spp., *Khaya senegalensis* and *Azandatehta indica*. While an estimated 80 000 hectares of plantations remain in Cameroon, they do suffer from a lack of proper maintenance.

Forest conservation measures

Decree Law n°95-446/PM of 20 July 1995 determining the implementation procedures for wildlife management stipulates that protected areas must be subject to management plans setting the time, place, nature and schedule concerning the programme of work and studies for a specific protected areas. The plans may be prepared by the administration in charge of wildlife or by private partners. In the latter case, management plans must be approved by the administration. Protected area management also extends to the buffer zone, defined as a "boundary area subject to agro-silvi-pastoral management essential to settle people on the land and regulate their activities". Cameroon is also setting up a trust fund to enable the DFAP (Directorate of Wildlife and Protected Areas) to strengthen management capacity.

As for the conservation of biodiversity, several protected areas (national parks and wildlife reserves) were established, and these now cover a little over 2 million hectares, of which 1.7 million hectares are forested. The national biodiversity action plan for Cameroon recommends a participatory approach and the earmarking of 30 percent of the country or 47.5 million hectares, as protected area. Many integrated development projects adapted to specific ecological conditions have also been launched. These are projects to combat drought and desertification in the sudano-sahelian zone, and specific ecosystem conservation projects such as Korup Park, Mount Cameroon, Mount Kilum, the Dja Reserve, the Lake Lobeke Reserve, the Boumba Beck Reserve, the Megame Sanctuary, the Ndeng Ndeng Reserve and the Limbé Botanical Garden.

Forest protection measures
Concerning forest fires and erosion, Decree Law n°95-531 of 23 August 1995 establishes procedures for the implementation of forest law. Articles 6, 7 and 8 allow prescribed burning under certain circumstances. Late-season burning is banned and early burning is regulated. A further official fire prevention regulation concerns the establishment of brushfire surveillance teams and centres. All managed forests must have a system of forest fire surveillance and control. As for erosion, Article 10 of the above law contains a proviso for declaring specific land areas off-limits, and the practical procedures for doing so.

Forest harvesting practices
Cameroon specifically stipulates forest-harvesting standards. The new Cameroonian legislation also declares forests off-limits after harvesting wherever the areas involved are too small to ensure indefinite felling cycles. Ministerial Order n°222/A/MINEF specifies, *inter alia*, items for consideration in estimating forest potential, which in turn determines felling cycles and minimum harvest diameters for managed species. The felling cycle is set at 30 years, and diameter can in no case be under the minimum set by the forest service. Additionally "all silvicultural treatments other than diameter-limit cutting must be such as to ensure forest recovery after the close of each felling cycle". These treatments must be described in the management plan, five-year plans, and annual plans of operation. The Guide for the preparation of production forest management plans within the permanent forest domain of the Republic of Cameroon was also approved by Ministerial Order n°0107/MINEF/CAB of 9 February 1998. The Guide describes a series of treatments, in particular diameter-limit cutting, with release of future trees, thinning/release of future trees, enrichment, tree-planting, devitalization and vine removal. It also stipulates the possibility of including other forms of silvicultural treatments in accordance with approved management plans. National Directives for the Sustainable Management of Cameroon's Natural Forests, a document published by MINEF/ONADEF(1998) proposes specific procedures for silvicultural treatments and harvesting. It recommends retaining 1.5 trees/ha for beneficial treatment, which means the proposed thinning would eliminate an average 2.5 trees/ha. This can be done by girdling or by chemical devitalization. In the course of the harvest inventory, the trees to be devitalized can be marked, and thinning can follow the inventory or be done during harvesting.

People living in rainforest areas retain their community user rights in the communal areas of non-permanent and permanent forest domains. As for non-wood forest products, a review of the legislation and regulations on hunting reveals quite detailed and specific legal provisions concerning wildlife. Access to game is regulated by law (Law n°94/01 of 20 January 1994 on forests, wildlife and fisheries). Most of this legislation involves a set of provisions specifying zones where hunting is permitted or banned, and the length and dates of the hunting season. It also specifies acceptable hunting methods and fees.

Public participation in forest management
The new participatory forestry law of 1994 calls for public participation in the design and implementation of forest management policy, enlisting the participation of all social partners from the governmental to the private sector and people living in and around the forest. This innovative new forest policy involves rural people in policy implementation through the promotion of communal and community forestry, ensuring that state-owned production forest management consider the interests of the rural public, according them substantial incentive benefits to enhance the protection of forest ecosystems. Concessionaires are in fact required to manage their forest concessions at their own expense under state supervision and in constant cooperation with people living in and around the concession. Under forest management law, they are also obliged to link the FMU with forest industries, thus providing opportunities for stable employment. The national directives for sustainable management of the natural forest stipulate that local populations are to be the first considered for these jobs. Local people are to receive 10 percent of the forest fees and taxes, and 40 percent of these fees are to go back to the local village or district. The funds are used for community projects identified in cooperation with local people and authorities. The budget also stipulates that an amount of 1 000 F/m³ of timber sold go back to the local population.

Funds from the community forests are to be spent in line with the general interests of the local villages. Each community may manage up to 5 000 hectares of forest, in accordance with a fifteen-year contract signed with MINEF. This management agreement does not confer ownership rights over the forest to the local community. The community has user rights which it exercises under state control, to sell timber, or to harvest with a permit or under personal authorization. As of 2001, seven forest communities held such contracts, and 14 simple management plans had been approved for an area of 16 000 hectares, mostly for production purposes.

Special programmes and incentives to promote sustainable forest management

Pilot management projects are primarily intended to improve the basic parameters of sustainable forest management plans and implementation. These projects are found throughout Cameroon's various forest formations. The Dimako pilot integrated management project for rational forest harvesting was launched in Eastern Cameroon Province. The So'o Lala Project launched in 1992 under ONADEF supervision on an FMU straddling Central and Southern Cameroon Provinces was based on a forest management plan designed to produce timber on a steady but sustainable basis whilst respecting the other functions of the forest. Since July 1994, the Cameroon Tropenbos Project (Kribi) has been an integral part of the Tropenbos Programme to enhance tropical forest management. One Tropenbos objective is to develop strategies and methods for sustainable forest management. The "Land and forests" project (1997) followed the Dimako project. Its objective was to provide support for the various forest management stakeholders with respect to the new provisions of the 1994 forest law. Other field projects in Cameroon focus on these changes and on identifying the local social and cultural underpinning for implementing community forest projects such as the Dja and Lokoundjé-Nyong projects.

Under the institutional guidance of the Community Forestry Unit of MINEF's Directorate of Forestry, various projects are looking at procedures for implementing the new law on community forests. The programme "Establishment of Community Forests in the Northern Section of the Dja Wildlife Reserve" has been working for the past year on a management plan for the Kompia community forest in Eastern Cameroon. Cameroon has made great strides in the issue of community forests, as its experience is based on translating the legal process into practical approaches for intervention.

The diversity of forest formations also holds great potential for the development of ecotourism. This has found concrete expression in two ONADEF/ITTO projects: the Ottotomo forest management project and the SIKOP project in the coastal province. There are also a number of sub-regional initiatives for cooperation and coordination in natural resource management (ECOFAC, REIMP, CEFDHAC, CARPE, etc.).

Trends in forest management

Cameroon has already developed the tools it needs for forest management. But implementation of the practical phase of management is still lagging behind. Since 1996, the allocation of FMUs under the new law has given new impetus to private sector forest management under government supervision in Cameroon. There is also a trend towards enhanced public involvement in forest management.

Key issues and concerns

Agriculture and livestock productions are the sectors directly responsible for deforestation and forest degradation. The direct contribution of industrial logging is, in fact, limited. But the development of infrastructure such as logging roads does have the indirect effect of making forests accessible to local people. There is not much hard numerical data on the state of plant cover in Cameroon, and what data we do have are fragmentary and uncoordinated. A great deal remains to be done, despite the considerable body of on-the-ground inventory work accomplished during the 1980s. The area of forest covered by inventories is not complete, and most inventories are old and obsolete. Plantation management follow-up is likewise mostly uncharted territory, which means there is also not much data available on reforestation.

There are five main stumbling-blocks to the implementation of forest management in Cameroon. These are: institutional weakness of the forest service, weak national forest enterprises, insufficient staff for management design and implementation, and a certain indifference to sustainable forest management on the part of the private logging companies. All this makes implementation of the battery of existing instruments for forest management something of a problem. Technical staff are too few and lack the necessary training. Management supervision by the authorities in charge is comparatively poor. The application of forest laws and regulations is hampered by substantial and ongoing irregularities. Weak logistics and human limitations are a constraint to field supervision of forest harvesting activities.

The legislation and regulations on the books are abundant and varied, which can be disconcerting for someone reading these texts. Forest management does not suffer from a lack of legislation or technical standards, the problem is rather that what is on the books has not been translated into action by users either unfamiliar with or unaware of the existence of these texts. There are certain inconsistencies as well. The most important thing now would be to ensure that the legislation and technical standards already in force are actually translated into action on the ground. The main remaining gaps concern poor on-the-ground implementation of sustainable forest management. The standards, techniques and approaches which have been developed, are neither sufficiently appropriate nor effectively implemented.

The boundaries of protected areas are ethereal as well, with local people crossing into or even actually settling within them at will. Conflict between the public services and the local rural population over land and resource appropriation remains a problem. Generally speaking, the protected areas are very poorly-staffed, with trained staff, funding and material resources in particularly short supply.

2.4. Central African Republic

2.4.1. Legal and institutional framework for sustainable forest management

Legal framework

The Central African Republic, a signatory of the Tropical Forests Action Plan (TFAP), also possesses the legislative framework for the establishment of sustainable management. Forest land use is currently governed by the 1962 forest code, which was revised in 1990. There are two main periods in the history of CAR's forest law. The first covers colonial times, which ended only in 1961, during which forest management followed French law. One year after CAR's independence, the National Assembly adopted the first law of the forest: Law n°61/273 of 2 February 1962 embodied the country's forest code. It stressed the definition of the different forest domains -- the public domain and the private state-owned domain. It tended to focus on the rainforest areas, regulating the activities of a number of logging companies working in CAR. At that time the State was the main if not sole player in the sector, together with foreign logging countries. Law n°90.003 of 9 June 1990 centres on perpetuating forest resources through conservation and management, whilst going beyond the highly restrictive framework of the earlier law with respect to the different forest domains. This new and more broad-ranging forest law covers all existing forest formations in the country. The new forest code also concerns taxation of the forest industries, and is geared towards the notion of management of the permanent forest. The importance of the role and rights of local people and private individuals in forest management and conservation activities is also dealt with. National forest management is underpinned by two other texts in addition to the forest code. These spell out the duties and obligations of both state and logging company, and the tax regime covering forest harvesting, exports and so forth.

Forest institutions and forest managers

The Ministry in charge of forestry, the Ministry of Environment, Water Resources and Forestry (MEEFCP) is responsible for forestry policy throughout the country. Its mandate is to centralize and coordinate the activities of all technical, administrative, material and financial services of the Department. It includes central services such as the General Directorate of Waters, Forests, Game and Fisheries, which are responsible for formulating measures for their respective sectors and organizing the division of labor within the Ministry and at the provincial level. Decentralized services in the various regions and localities in the interior include the Regional Forestry Divisions (field agencies executing measures originating in the capitol, Bangui). Sixteen Regional Divisions with one division per prefecture link the field with the central services. Cantons, or the smaller "garderies", are found in each sub-prefecture, each with several forest rangers.

The Forest and Tourism Development Fund has replaced the former national «offices» (services) covering forests (ONF), tourism (OCATOUR), and the national Centre for wildlife protection and management (CNPAF). The Fund now comes under MEEFCP, and its mandate is to levy the scheduled taxes on forest, game and tourism activities, and fund the relevant public service activities in these sectors. The Chamber of Agriculture, Livestock Production, Waters, Forests, Game, Fishing and Tourism works with the private sector and acts in an advisory role to the Ministry of Environment on questions concerning forest management. The Ministry of Trade and Industry works with the Ministry of Environment to fix commodity prices, especially the mercurial (taxable) values of forest products (logs and sawnwood). The Ministry of Economy, Planning and International Cooperation works at several levels in the forestry sector, including fund-seeking for investments, assessing the impact of the sector on the national economy, general investment forecasts, and forestry staff training. The Ministry of Finance and Budgetary Affairs is the major player in implementing forest policy, as it allocates MEEFCP's budget and reviews forest fiscal measures, which has a major impact on all development efforts in the sector.

Several private logging companies, crucial partners in forest management, are working in the sector. These mainly European companies with European capital include Thanry, SEFCA Mbaéré (*Société d'exploitation forestière centrafricaine*), IFB Batalimo (*Industrie forestière de Batalimo),* SCAD *(Société centrafricaine de déroulage*), SESAM Nola (*Société d'exploitation de la Sangha-M'Baéré*).

A number of NGOs, such as *Pavillon vert* and the *Organisation centrafricaine de défense de la Nature,* are also involved in sustainable forest management. Research institutions are not highly developed in CAR, with just one working at the present time, the Central African Institute for Agricultural Research, ICRA. The Institute has two forest research units, one for rainforest and the other for savannah woodland.

2.4.2. Status and trends in forest management

History of forest management and silviculture

Forest conservation efforts have their origin in colonial laws passed in 1916 concerning the establishment of national parks and reserves. The first national park was established in 1933, and the first game reserves also date from the 1930s.

Because CAR is a landlocked country far from international markets, the southwestern forests were not opened to commercial logging until 1945, and even then on a fairly small-scale basis, with a few logging companies working in Lobaye to produce sawn wood for the local market. In the early 1950s, an inventory programme was designed and implemented by the national forest service, and later by the Tropical Forest Technical Centre (CTFT). The objective was a detailed review of the state and size of exploitable rainforest and the potential value of the standing crop of high-value forest species.

CAR was one of the first African countries to undertake forest inventories and to call for detailed regulations and management plans as a prerequisite to harvesting permits. In 1967, the first forest harvesting permits (temporary harvesting permits, the "*Permis temporaires d'exploitation*" or PTE) were issued in the prefectures of what are now Haute Sangha and Mambéré-Kadei. At that time, a logging company could only move in after a convention had been signed between the company and the Ministry of Forestry. The permit covered the size of the concession, production targets, the reciprocal duties of company and government, plus controls and sanctions. These earlier permits represented comparatively small areas, and were rarely valid for longer than five years. Until 1970, logging was confined to the Lobaye forest within a radius of 130 kilometers around Bangui. The total area of forest concessions was 442 900 hectares in 1969, 842 00 hectares in 1985 and a little over 3 million hectares in 1999. Forest logging now requites a harvesting and management permit (*Permis d'exploitation et d'aménagement*, or PEA) which is valid for the lifetime of the company. Ten logging companies are active in CAR. A substantial proportion of the southwestern forest, some 86 percent of the total, is under concession. The as-yet unallocated public domain forest covers some 1.3 million hectares. This includes 0.3 million hectares of forest reserves, comprising 250 000 hectares of reserves and parks and 50 000 hectares of classified forests in the southwestern zone. Unallocated area thus totals about one million hectares, but much of this is made up of secondary forest.

Tree-planting activities are relatively recent in CAR compared to other African countries. The ONF (*Office national des forêts*) was established in 1968 with a mandate to reforest and manage classified areas. The ONF established plantations in Lolé, Mokinda and Sakpa. From 1968-69, planting trials were also run on *Tectona grandis*. Plantation activities only really got underway full swing in 1972. The area currently under forest plantations is estimated at 3 000 hectares. Plantation programmes established by the Ministry in charge of forests are still in the experimental stages, and planted areas are quite small for lack of an effective reforestation policy.

A great deal of research and studies came out of forest management-linked projects in CAR on such subjects as silviculture, dendrometric studies and the like. The Central African Rainforest Management plan and the research effort in M'Baiki are two examples. With the enactment of the wildlife protection code in 1984 and the various international and regional conventions to which CAR is a signatory, CAR's legislation on environmental and wildlife conservation began to reflect a general vision based on a new approach. Beginning in 1985, FAO supplied assistance to implement a nationwide wildlife management programme. In 1994, the PARN project inventoried the entire southwestern rainforest.

In the last several years, the Government has undertaken sweeping reforms in the forestry sector. These concern revision of the legal and regulatory framework, including the adoption of a code to protect wildlife, a revised forest code, a restructured MEEFCP, the elimination of ONF, CNPAF and OCATOUR and the establishment of the Fund for Forest Development and Tourism (FDFT). A 1980-1990 process intended to de-link the state sector involved a vast programme of privatization. At a very early date, the Government encouraged in-country wood processing, and by 1994 it decided to ban log exports altogether to boost local processing of wood products. At the same time, export taxes were lowered to offset the landlocked factor and the inherent high production costs for reaching ports of exit.

Under current policy, CAR stresses the development of the forest sector through the management requirement attached to all harvesting permits, reduced volumes of log exports so as to increase local processing of wood products, the involvement of private partners, NGOs and local people in the forest management process, and expanding the share of financial benefits from forest exploitation for local communities.

Criteria and indicators for sustainable forest management

A "criteria and indicators" test for sustainable management was done by ATO in CAR in 1998 for eco-certification of CAR timber to favor access to profitable northern European markets. The ATO method, developed under a CIFOR project, concretely tested various criteria and indicators for sustainable African forest management on a forest site then being harvested by a logging company. The ATO test objective is to propose a set of optimal principles, criteria and indicators (PCI) for the given site. The next step is a comparative analysis of field data to produce a final set of PCI applicable at the country level for each member state. For CAR, the test was done in November 1998 by a team of experts on two sites exploited by IFB in Batalimo and Ngotto. IFB exploitation of the Ngotto forest under a national or regional eco-certification programme could allow the company to obtain the eco-certification label. The set of PCI and verifiers which came out of the CAR test fully integrate several important changes in policy and social domains. It also highlighted the sustainable management dimension in a very valuable way. There are four principles involved: policy, management, ecology and social questions. Each principle groups several criteria, indicators and verifiers, several concerning local populations.

Current practices for sustainable forest management

Management objectives
The objective of the current forest code is rational and sustained management of the forest ecosystem so as to ensure lasting forest resources and protect forest diversity. It covers exploitation, reforestation and natural regeneration. It aims to bring the earnings imperatives of the sector into line with the need for forest conservation in a context of multi-use management to conserve and protect plant formations and ensure that the forest will endure. Two principles were set forth to achieve these goals: protect forest reserves and minimize deforestation.

Forest management measures
Under the current forest code, concessions are allocated for an indeterminate time, with a permit to log areas of up to 300 000 hectares per concession, with the logging company responsible for forest management in the concession. The PEA spells out the harvesting regulations with which companies must comply. The main features of the PEA are as follows:

- The permit is valid for the life of the company.
- PEA are allocated for larger areas than PTE. The logging company is responsible for management activities.
- Local people are also involved in the process of establishing permits.

Silviculture
CAR's greatest timber assets feature a small number of commercially valuable species. The main forest species logged are ayous (*Triplochiton scleroxylon*) and limba (*Terminalia superba*) for plywood, sipo (*Entandrophragma utile*), sapelli (*E. cylindricum*), tiama (*E. angolense*) and dibetou (*Lovoa trichiloides*). Experimental designs have been in place in the Mbaiki region since the 1980s to study the dynamics of natural forest under various silvicultural treatments so as to devise silvicultural practices that successfully reconcile conservation with sustainable forest production. The dimensions studied were: the dynamics of untouched natural stands, tree growth in a natural stand following harvesting with or without thinning through devitalization, general stand behavior, etc. The silvicultural rules laid down by the forest code concern reduced impact logging to enable natural regeneration and avoid high-grading (skimming off the cream of the forest crop), stipulating minimum harvest diameters, and the protection of young trees during the extraction process.

Forest plantations are only in the very earliest stages in CAR. Leaving out the teak (*Tectona grandis*) plantations established by FAO in the Bimbo forests in the 1960s, tree-planting efforts only truly took off in 1972. The plantations generally included fast-growing species with an estimated felling cycle of 40 years, including *Eucalyptus, Cedrella, Cordia* and all red wood species processed or used for veneering. *Gmelina arborea*, *Terminalia ivorensis* and *Pinus* spp. were also planted. In the Mbaiki plantations, timber production is the only objective, and so the species planted include sapelli (*Entandrophragma cylindricum)*, sipo (*Entandrophragma utile*) and tiama (*Entandrophragma angolense*). These plantations were not successful, however, for lack of maintenance and monitoring, and at present the reforested area amounts to just a little over 3 000 hectares, mostly full plantations, and about 80 hectares of in-forest strip plantations.

Forest conservation measures

Today's forest code spells out seven categories of protected areas: full nature reserves, national parks, wildlife reserves, recreational forests, protection areas, reforestation areas and production forests. Meanwhile, a wildlife protection code came into force with Ordinance n°84.045 of 27 July 1984. A study by ECOFAC-CAR (Conservation and rational use of forest ecosystems in Central Africa/CAR component) and the European Union in 1998 proposed that the code be updated. The proposed amendments have not yet been ratified by the competent authorities. So-called special reserves have also been established as an offshoot of these two laws. Lastly, at the presidential level, there have been expressions in favor of more rational management, enhanced natural resource conservation and greater adherence to existing legislation, as per Presidential Directive n°0001/90 PR of 16 March 1990. The establishment of the Dzanga-Sanga Reserve and Dzanga-Ndoki National Park by teams from the Wildlife Conservation Society (WCS) and WWF (World Wide Fund for Nature) in December 1990 substantially expanded the amount of protected area. The Basse Lobaye Biosphere Reserve is another rare forest protected area. CAR now has a network of protected areas covering nearly 5 million hectares, or eight percent of the national territory, including 4 160 800 hectares of forest.

Forest protection measures

Boulvert (1986) describes savannah brushfires capable of reaching fronts as wide as 200 kilometers. Half of the country's territory or even as much as 75 percent burns every year from fires started by people. Brushfires are very widespread in savannah as in transitional forest-savannah areas. An estimated one percent of the dense evergreen forest area is affected by fire, some 14 percent of the semi-deciduous forest, some 60 percent of the sudano-guinean zone, half of the mid-sudanese zone and 36 percent of the sudano-sahelian zone. Close collaboration between a number of agencies such as CACEU (Central African Customs and Economic Union), MEFCPE and the National committee for the prevention of fires, brushfires and other calamities (CNLIFBAC) led to the establishment of a fire observation tower in 1998.

Forest harvesting practices

The main species exploited are the Meliaceae and species such as ayous, limba and aniégré. Industrial logging is done under PEAs of unlimited duration on concessions large enough to allow simultaneous production and reconstitution of the forest cover. Alternating cycles of felling and regrowth are thus observed, with felling cycles of 40-50 years. Permits are allocated by mutual agreement to companies adhering to the rules of the forest code: reduced impact logging to enable natural regeneration and avoid high-grading (creaming off), observance of minimum harvest diameters, protection of young trees during extraction operations, protection of the work site and closing tracks to prevent unauthorized incursions for shifting cultivation and other unauthorized activities in production forest areas, and, lastly, involving local people and loggers in conservation, management and reforestation work. Industrial logging remains selective, with some 10-15 stems/ha of high-value commercial species extracted, and a minimum harvest diameter of 50 centimeters. Forest harvesting practices in natural forests concern the harvesting rate. The annual subdivision of the concession scheduled for cutting is defined in terms of a share of the nominal felling forecast by the logging company expressed in cubic meter of raw logs and number of trees, on the one hand, and management requirements on the other.

Public participation in forest management
The forest code in force involves local people in the forest management process. Forest harvesting by local people is based on the introduction of a forest domain for local communities and private individuals, and on customary rights. The forest domain as a whole comprises the state-owned forests (protected areas, reforestation schemes and production forests, the community forests, which have been classified by decree or reforested and managed by the local people, and private forests planted by private individuals on their own property. Public participation in forest management gives local people a say in the process of logging permit allocation, and redistributes a significant share of forest taxes to the local communities. Consideration of the needs of the local people and the integration of logging activities into the local economy are basic components of the new sustainable forest management approach.

Special Programmes and incentives to promote sustainable forest management

CAR's growing awareness of the threat of environmental degradation has found expression in the 1986 official introduction of Arbor Day, the establishment of a national natural disasters committee in the early 1990s and the revision of the forest code in 1990. CAR's decisive commitment to sustainable forest management policy has also taken the form of recent pilot management operations bringing together private partners, NGOs and local people. The CAR component of the ECOFAC programme, for example, has the Ngotto forest as its project area, with one objective being cooperation with a logging company, IFB, on a pilot sustainable forest harvesting project. Consideration of the needs of local people and the integration of logging activities into the local economy are also fundamental components of the new management approach. A further example is the Sangha-Mbaéré Forest, where the objective is rational resource exploitation. A second regional Programme, REIMP, the Regional Environment Information Management Programme, which aims to enhance the circulation of environmental data and the results of existing projects in the sub-region with an environmental information component. CARPE (the Central African Regional Programme for the Environment) is present in all of the Congo Basin countries, with a mandate to combat deforestation and loss of biodiversity.

PARN, the natural resource management project (at the time of writing into its second phase --1996-2000); the Salo management project in cooperation with the SESAM logging company concerning implementation of the provisions of the new forest code on exploitation/management; and PARPAF (support project for the preparation of forest management plans -- a four-year project in the Berbérati region), all deserve mention. Several studies concern overall knowledge of CAR's forest resources, such as the forestry research support project (PARF), featuring observation of the regeneration and phenology of selected species. Reforestation and forest management activities are also in the pipeline for the area around Bangui, and in the prefectures of Lobaye and Sangha Maéré. Other measures, such as the establishment of a Forest Fund financed by domestic taxes and external resources have supported the implementation of natural resource protection programmes. The economic alternatives approach, based on a combination of incentives and disincentives, is increasingly used in the field, particularly in connection with the payment of salaries and sharing the financial benefits of projects, especially tourism-related projects. A National Environmental Action Plan (NEAP) and management master plan have been formulated. These two tools should serve to enhance forest and environmental resource management.

Trends in forest management

There has been a substantial shift from centralized forest management focussed on timber production to multi-use management enlisting, to a growing extent, the participation of local people. There is a clear trend towards greater consideration of the needs of local people, and the integration of the logging sector into the local economy, as the twin fundaments of the new sustainable forest management approach. The new guidelines of forest ecosystem management now concern four sectors: planning processes, protected area management, the establishment of “community” or “village” forests, and, lastly, forest management for timber production. A further and striking event of the last decade concerns the introduction of institutional reforms and new forest legislation based on a new determination to decentralize forest management.

Key issues and concerns

Deforestation, while not very extensive in CAR, arises out of a number of factors, ranging from the direct impact of logging, urban expansion, etc., to the indirect impact of socioeconomic factors such as poverty and international market fluctuations (etc.), to policy factors such as poor management. There is also the phenomenon of degradation which is difficult to pinpoint and quantify, in that timber in CAR tends to be “mined” rather than harvested, partly due to the country’s landlocked status, which places it at a disadvantage in competitive terms. The upshot of this situation is the diminished quality of CAR’s forests, which is endangering the future of the preferred high-grade species. The threat is both ecological, in terms of forest impoverishment, and economic, in terms of the loss of the target resource, and can only loom larger if this kind of harvesting reaches out, even once, to all forest zones in the country. This is aggravated by the fact that existing forest legislation governing resource renewal is not always enforced. The problems of applying the law and monitoring management programmes, including various gaps in the forestry administration and agencies involved, are major factors which run counter to sustainable forest management at the country level. Institutional weakness and instability and the lack of well-trained forestry service staff, as well as the material resources to backstop their efforts, are further aggravating factors. Protected areas are large and numerous, but they are also often mismanaged. For lack of logistical and human resources, systems to guarantee the protection and conservation of these areas have not been put in place, and they are exposed to a varied and uncontrolled onslaught from brushfires, poaching, transhumance and the like, which act to accelerate their degradation, particularly those falling outside the project areas of forest protection and development projects.

2.5. Chad

2.5.1. Legal and institutional framework for SFM

Legal framework

All legislation enacted since independence in 1960 and up to the 1989 draft forest code focussed on the conservation of forest resources. The 1989 draft code, which concerns forest, game, river and lake resources, has not been enacted or implemented so far. Law n°23 of 22 July 1967 covered the public domain and environmental conservation on public lands. The 1976 N'Djamena Manifesto dealt with conservation and Chad's national heritage. Law n°36/PR/94 of 3 December 1994 specifies that both natural forests and planted forests on public land belong to the State. Such forests are demarcated, and eventually managed and classified, throughout the national territory. This law regulates timber harvesting, transport and marketing at the national level. It also spells out the implementation and monitoring of national forests and environment policy, the planning and scheduling of operations, and the design and preparation of strategies to combat desertification, plus coordination of the relevant programmes. Law n°14/PR/98 of July 1998 lays down the general principles for environmental protection, stipulating the need for balanced, rational forest management. Management, development and exploitation plans must give voice to environmental concerns so as to ensure that the protective functions of the forest are reconciled with economic, social, cultural and recreational uses.

In 1999, with FAO assistance, the Government revised the draft forest code defining the principle of sustainability and participation of all stakeholders in the forest sector. In March 2000, it also launched the preparation of a National Environmental Action Plan, scheduled for adoption by the end of 2002.

Forest institutions and forest managers

The forest domain consists of stands for which the forest service is responsible, including classified forests, protected and closed forests, national parks, wildlife reserves and hunting reserves, and reforestation areas on state-owned forest lands. The private forest domain, belonging to local communities, covers a very small area, despite the fact that, in Chad, land is traditionally thought of as a collective resource belonging to all social groups. The end result is a juxtaposition of practices arising out of two major land tenure systems, both currently in force, the traditional system based on customary rights and the modern system of ownership which has come down from the French colonial system.

The Ministry of Environment and Water Resources (MEE) is responsible for implementing national environmental policies (including fighting desertification and natural resource management) and for applying policies in the matters of urban, village, agricultural and pastoral hydraulic, as well as drainage, meteorology and hydrology. These attributions are executed by several technical Directorates. Concerning forestry matters, it is the Directorate of forest protection and desertification fighting that is responsible for the conception and elaboration of the strategies for desertification fighting, the knowledge and the maintenance of forestry potential, the maintenance and the protection of the classified forests, the management of the region, etc.

Other technical directorates under the MEE include the Directorate of fauna protection and National Parks, the Directorate of Fisheries and Aquaculture, the Directorate of Water Resources and Meteorology and the Directorate of hydrology. The administration responsible for protected areas is the Wildlife Management and Conservation Department under the Directorate of fauna protection and National Parks. A National High Committee on the Environment was also enacted into law in 1995 to stimulate, harmonize and monitor the implementation of environmental policies and strategies. Its President is the Prime Minister.

There is no specific institution in Chad responsible for forestry research. The Centre for Applied Research, founded in 1987 and now the Research Support Centre, is responsible for research support upon ministerial request.

2.5.2. Status and trends in forest management

History of forest management and silviculture

Reforestation operations in Chad were launched in 1950 with the establishment of the forest service in 1949. Early on, plantations were established as a soil protection measure. During colonial times and up to independence in 1960, plantations and plantation management were the responsibility of the forest service. Tree-planting by communities and private citizens began to be encouraged in 1961

Successive droughts have raged over most of Chad since the 1970s. The Government has been trying ever since to combat desertification by installing forest plantations and by soil conservation and rehabilitation efforts. In particular, the forest services afforested a protective "green belt" around the city of N'djamena. Today, almost all of this green belt lies within N'Djamena's city limits. In 1973, the Government declared a national tree week during which people were encouraged to plant trees, and a vast tree-planting effort took place at that time.

A number of forest development projects were implemented during the 1970s. The "Forestry Activities" project, for example, was launched with the twin objectives of implementing the National Plan to Combat Desertification (PNLCD), and developing technical and socioeconomic models for forestry development. The PNLCD was formulated in 1988 and adopted by the Government in 1989. The objective of the "Rural Forestry and Forest Management for Fuelwood Production" project was designed to promote rural forestry in the Batha area, and to devise a management plan for the natural forests. From 1989 to 1996, the basic orientation of this project was to have rural people and communities assume greater responsibility for managing their local forest resources.

Since 1994, the main priorities have been democratization of the political process and national reconstruction. Little by little, this has led to the return of peace, after several decades of war. The Government subsequently adopted a programme of financial stabilization and economic reform, at the same time defining and implementing a new medium-and long-term development strategy, redefining the role of the State and taking a fresh look at sharing responsibilities with its partners.

A new forest code adopted in 1999 spells out the principle of sustainability and the participation of all stakeholders in the forest sector. In March 2000, the Government also undertook the preparation of a National Environmental Action Plan, to be adopted before the close of 2002.

Criteria and indicators for sustainable forest management

Funded by the FAO, a workshop on the validation of C&I on sustainable management of the Chad forests, has been held at the forestry formation center of Milézi at Djaména (19/04/2002). This workshop reunited representatives of public and private sectors, NGOs, and civilians. During the workshop, seven criteria and at least 50 indicators were adopted, covering the technical, social, economical, ecological, political (including jurisdiction) fields. A programme of some criteria implementation also has been adopted.

Current measures for sustainable forest management

Management objectives
Classified forests belonging to the state and public domain forests now cover 593 000 hectares, and are, in theory, managed for production or protection purposes. Forest plantations cover only a very small area of 14 000 hectares. Protected areas, on the other hand, represent an overall area of over 11 million hectares. The 1989 forest code does nonetheless specify that at least 30 percent of the national territory should be covered by domain forest.

The forest service is currently pursuing four broad lines of strategy. These are: protection and regeneration of ecological resources, including the restoration of forest and grassland potential; enhanced plant resource management and soil protection; the design of a national land use planning scheme; beefing up institutional staff resources and strengthening the legal framework; and improving plant and animal production systems. The country also wishes to expand and reinforce the amount of protected areas.

Forest management plans
Law n°36/PR/94 stipulates that forest in the State domain may be leased in concession for the benefit of a local authority, rural or village community, or national enterprise, under conditions and procedures defined by decree. All forest harvesting operations are subject to a list of specifications spelling out the technical conditions concerning exploitation of the products involved, which must be preceded by an inventory. The area allocated to a single lease may not exceed 50 000 hectares.

Physical and moral persons are the owners of trees/forests planted on land they own. The owners of private forests may obtain a license for their forests upon request from the forestry administration in their prefecture.

Silviculture
The main species planted are neem (*Azadarichta indica*) and *Khaya senegalensis*, as shade-trees and for row-plantings, *Eucalyptus* spp. and *Parkinsonia aculeata* for hedgerows and windbreaks, *Acacia nilotica, Prosopis juliflora* and *Acacia senegal*. Forest nurseries, managed by the forest service usually with the active participation of village communities, are found in all the head prefectures. State-owned plantations are increasingly giving way to village plantations. Planting density in arid zones is about 1 100 seedlings/ha. Felling cycles

for fuelwood production can be 4 to 5 years, with *Eucalyptus* spp. in the sudano-sahelian zone. For the production of poles, a longer cycle is required, about 6 to 7 years, at spacing of 4 x 4 m, for full planting.

Forest conservation measures
The first piece of legislation on environmental protection and conservation was Decree-Law n°47-2254 of 18 November 1947, amended by Decree n°52-182 of 18 February 1952, regulating hunting on French overseas territories. Ordinance n°14/63 of 28 March 1963 concerned hunting regulations and nature protection, and defined the various types of protected areas.

The master plan for desertification control was prepared in 1989. Its objectives were ecological resource protection through improved crop management, soil protection, rational tree felling operations, various types of afforestation, and motivating people for efficient wood utilization. A sub-programme on the conservation and enhancement of biodiversity was also adopted. Its principal objective was to safeguard and rehabilitate Chad's plant and animal resource heritage. Several laws were enacted to reinforce ecosystem sustainability, including Chad's ratification of the Convention on Biological Diversity, Decree n°0822/MET/95 of 20 October 1995 establishing a National High Committee on the Environment (HCNE), the ratification of the international Convention to Combat Desertification and the United Nations Convention on Climate Change.

In 1998, Law n°0144/PR/98 laid down the general principles of environmental protection. In addition to its general provisions, it also sets forth the fundamental principles, enforcement agencies, protection of the environment and national heritage, environmental management instruments, such as the setting of quality standards, financial and fiscal incentives, the establishment of a special fund for the environment and the obligation for those exercising any activity resulting in environmental degradation to remedy any damage done at their own expense. The administration responsible for protected areas is the Department of Wildlife Management and Conservation.

Protected areas in Chad now consist of two national parks totaling 414 000 hectares and seven wildlife reserves totaling 11 080 000 hectares, or a total area of nearly 9 percent of the national territory. This amounts to 11.5 million hectares, of which about 150 000 hectares are forested.

Forest protection measures
No formal evaluation of damage from wildfires or diseases has been carried out in Chad. It is quite likely that over 80 percent of the forest and woodlands are affected by brushfires every year. Protection measures in forest plantations consist of the establishment of weeded firebreaks. Fire protection in natural formations is centered on awareness-building among local populations through the media, especially rural radio.

Forest harvesting practices
Forest harvesting in the domain forests is done under state control by the forest administration or else subject to an authorization granted by the forest administration. The authorization to harvest is accompanied by a tax which is fixed by the Budget. The area which can be contracted by a single lease may not exceed 50 000 hectares. Harvesting in the private state-owned forests may be allowed via a cutting permit (for amounts less than 50 trees or 500 steres, or by sale of standing volumes or by license. Harvesting comes with specifications concerning the technical terms for harvesting the product in question. Forest concessions may be granted to a local authority, or rural or village community. Harvesting methods and conditions of access are in this case determined by ministerial order. The principal species harvested are ronier (*Borassus aethiopium*), *Anogeissus leiocarpus, Khaya senegalensis* and *Balanites aegyptiaca.*

With respect to the harvesting of non-wood forest products, one especially important source of income is gum arabic. Other important forest products, depending on the region, are shea-nut, néré and other minor forest products, mainly for food, fodder or pharmaceutical purposes, home consumption or small-scale trade. The forest code of 1989 had a chapter on gum arabic trees, specifying that gum arabic trees in the private state-owned forests may be tapped free of charge by communities subject to observance of the technical standards for gum-tapping, such as the season, established by the forestry administration. Unproductive gum arabic trees may be cleared provided an artificial plantation of equivalent size is established, or that at least 20 seed trees/ha are maintained *in situ*. An agreement for the commercial or industrial exploitation of gum arabic is obligatory.

Public participation in forest management
The historical forest policy orientation in Chad with respect to forest conservation made no mention of the public, and people tended to be rather suspicious of foresters, who were regarded as agents of repression. The development of rural forestry is hampered by a failure to adapt existing legislation. The laws still on the books are in fact repressive, offering few incentives for the public. There is no law giving people secure access to forest harvesting, even when they have actually planted the trees in question. In this context, not much real progress has been made in handing over responsibility to the local people. Nonetheless, the new forest code does allow title to be granted in rural areas to land reforested or regenerated by private citizens. Moreover, the recent Law n°14/PR/98 stipulates that any citizen acting as an individual or in the context of traditional local institutions or associations is responsible for working with the State and the decentralized local communities to ensure resource sustainability and combat environmental degradation.

There have also been participatory forest projects, such as the 1989-1996 “Rural forestry and forest management”, which was basically designed to make rural people and local community structures responsible for local forest management in their area through the formation of village forest management associations. Efforts have been made to motivate and inform rural people as to the benefits of the participatory approach via rural radio, and by the Chad multi-media anti-drought and desertification committee.

Special programmes and incentives to promote sustainable forest management

As part of its general socioeconomic development policy, the Government has set up four technical units, including a technical unit for rural development. This unit is responsible for matters concerning livestock production, agriculture, the environment and water resources. The development sector was also the subject of a sectorial consultation held in June 1999, helping to dovetail the various sectorial strategies for rural development, including strategies to implement the international conventions ratified by Chad on the ozone layer, climate change, biodiversity and desertification.

Concerning conservation, the National High Committee on the Environment was formed to guide and follow up on all activities having to do with environmental management. The political will of the Government of Chad to implement environmental protection is expressed in its ratification of the various international conventions mentioned above.

As for efforts to combat the desertification process, various tree-planting programmes have taken place, such as green areas, the N'Djamena green belt, and so forth. Tree-planting by the forest service also took place in the context of National Tree Week. The first programmes used the system of cash premiums for tree-planting and maintenance, and later premiums in kind (food for work) through the World Food Programme. The same systems were also used to encourage the natural regeneration of forest trees in fields. The new forest code, in an attempt to encourage private or community reforestation, also allows for the granting of land title for land reforested or regenerated by individuals or communities. Studies and pilot management plans are also in the pipeline for all areas of Chad threatened by the encroachment of the desert. The idea is to test preventive and curative approaches to the problem of desertification in the land management context. A national committee for improved cookers has been set up to control the unauthorized harvesting of fuelwood. It develops and distributes these improved cookers to local people. Efforts are also underway to encourage the use of alternate energy sources.

Trends in forest management

Historically, Chad's forest resource conservation policy orientation excluded public participation. In earlier times, forest management was based on strict repression, and the results were mixed if not mediocre. Mounting awareness of the issues involved led to a number of government initiatives such as the formulation and adoption of a 1989 national plan to combat desertification, a global framework for the use and management of natural resources, and the preparation of a new forest code calling for the transfer of responsibility for natural resources to local people and private citizens and a reorientation of the role of the state. The country also intends to reinforce the current arrangements for resource protection, expand its protected areas, and introduce watershed management. All these operations plan to enlist the participation of local people in line with the trend towards decentralization.

A number of completed or ongoing multi-purpose projects were largely devoted to the development and sustainable management of forest formations. The outcome of these various projects led the Directorate of forest protection and desertification to redefine its forestry development and environmental protection policy, putting management on a participatory basis and ensuring the rational and sustainable management of Chad's forest potential.

Key issues and concerns

More than thirty years of civil war have taken a heavy toll on the economy, and especially on the forestry sector. Chad also remains one of the world's poorest countries. A rapidly growing population has only accentuated these negative trends and poverty is among the most severe problems faced by the country. Destabilization of the forest service has been one outcome of this political instability. Population displacements have also created a situation of imbalance in the natural forests, with illegal clearing of domain forests to plant food crops, unauthorized tree-cutting, brushfires from slash-and-burn and overgrazing on grasslands. Since 1990 or thereabouts, however, the political situation has stabilized to some extent.

Thus, recent decades have witnessed the gradual degradation of Chad's natural resources over the long years of drought, but also as a result of increasingly intensive exploitation, a trend which pre-dated the drought by many years. Environmental degradation, entailing the gradual depletion and disappearance of the natural resource base, takes the form of decreased soil fertility and accelerated soil erosion, lowered water tables, dried-up watercourses, the disappearance of perennial species and a general impoverishment of biological diversity. Chad is heavily affected by the processes of drought and desertification that have become the norm in recent years in the wake of a series of factors such as chronically low rainfall and successive bouts of drought, compounded by long years of war and the growing pressure of people on the forest. Soil and water conservation is therefore a major and crucial problem in Chad. Water erosion problems are present on a vast scale in certain massifs, such as Ouaddaï, Biltine and Guera, and in a much more localized way in the rest of the country. Sand intrusion is mainly a problem in the regions of B.E.T, the Lake Chad district, Kenem and Batha.

There are also serious institutional constraints, such as the fact that forest service staff are too few and too poorly-trained to address the challenges of appropriate forest management. This translates into inadequate enforcement in the field. Short-staffing is compounded by the following constraints: existing staff are still not comfortable with the participatory approach, there is a failure to coordinate activities in the field, and there is simply no database for most rural development-linked sectors. In addition, the forest code adopted in 1989 by the Government remains on paper, having been neither promulgated nor adopted. Nor are the land laws being implemented for lack of the relevant application texts.

2.6. Congo

2.6.1. Legal and institutional framework for sustainable forest management

Legal framework

A new forest code law on sustainable forest management, Law n°16-2000 was recently enacted (20 November 2000). Its objective is to establish the appropriate legal framework for sustainable forest management. Rational resource management, definition of the national forest domain, setting standards and criteria for participatory management, and reconciling the harvesting of forest products with the demands of forest conservation and the preservation of biodiversity form the foundation, all in the context of sustainable development. The new code is mindful of both the drawbacks and the strengths of the former code (Law n°004/74 of 4 January 1974, amended by Law 32/82 of 7 July 1982), and the international demands of modern forest management. The new code sets up a forest fund financed by a variety of taxes and revenues, which will be used to fund silvicultural treatments and reforestation. It also spells out the various types of forest harvesting permits.

Environmental management is regulated by Law n°03/91 of 23 April 1991, designed to reinforce the protection and preservation of wild plant and animal life and enhance the management, maintenance and protection or conservation of both the natural resource base and Congo's cultural, natural and historical heritage, as well as to protect against any onslaught on the environment or on the health of people or their property. A new law on the management of protected areas is also in the preparatory stages with assistance from FAO.

Forest institutions and forest managers

The Ministry responsible for forests and water has restructured its administration:

- A General Directorate, executing agency of the national forest policy;
- A General Inspection of forest economy, instrument of control and evaluation of policies and programmes.

In addition to these structures, state-owned and also privately-owned agencies also exist and are involved in silviculture, research and conservation:

- *Eucalyptus du Congo* (ECO-sa), private structure of afforestation and reforestation;
- National Reforestation Department (SNR), state-owned agency specialized in reforestation;
- Agricongo (International Institute for the promotion and the development of agriculture);
- About 50 private companies, working in all branches such as forest harvesting, timber processing and grouped into the professional syndicates (Unicongo, Unibois);
- NGOs and conservation Institutes such as the Howlette and Port Limpé Foundations, the Wildlife Conservation Society (WCS) and the Jane Goodal Institute.
- The Research Unit on industrial tree stocking productivity (URP2I);
- The Limba Pilot Afforestation Center (CPAL);
- The Center for Forestry Research of the Littoral (CRFL);
- The Center for Forestry Research of Ouesso (CRFO);

The new law includes, in the frame of institutional capacity building, the creation of new structures in order to complete the forestry administration. These new structures are the following:

- a public department responsible for implementation of national inventories;
- a public department responsible for controlling forest product exports (replacing the former OCB, *Office congolais des bois)*;
- management brigades responsible for the execution of management plans in the FMUs that are not under transformation-management conventions).

2.6.2. Status and trends in forest management

History of forest management and silviculture

Congolese forest harvesting, selectively targeting just a few high-value species, arose out of dawning European awareness of the value of these woods in the early nineteenth century, with Europe becoming the prime export destination. The earliest reforestation efforts date back to 1937, but commercial reforestation as such took off only in 1947 with ironwood (*Casia siamea*), teak (*Tectona grandis*), limba (*Terminalia superba*) and a few others. From 1948 onwards, 6 500 hectares of limba were established in the Mayombe forest area.

In the aftermath of World War Two, with the opening of the *Office des bois de l'Afrique* based in Libreville, modern harvesting of the natural forests was launched under a few major national forestry enterprises based in the southern part of the country. During the post-war colonial period 1945-1960, Congolese forest management came under French laws and regulations.

Up to the early 1970s, the Congolese forest represented the country's major natural resource, before becoming supplanted by oil. With the depletion of forest resources in the southern part of the country, harvesting operations moved into the tropical rainforest areas of central and northern Congo. In the 1950s, Congo began to implement a reforestation programme to reconstitute degraded forest areas and poor soils in the Congolese savanna area, introducing pines and eucalyptus.

Congolese forest management efforts were first launched in the early 1970s. At that time, over 2.5 million hectares were inventoried by FAO, the Technical Tropical Forestry Centre and Polytechna to serve as the basis for management plans focussing on annual timber harvesting programmes. Congo's two-track forestry research policy initially stressed forest genetic improvement and vegetative reproduction of fast-growing exotic species. The results from over 30 years of efforts have made the Republic of Congo a leader today in the genetic improvement of selected species such as eucalyptus, pines and limba, and in clonal plantations of hybrid eucalyptus.

The major upheaval in Congo's forest legislation took place in 1974 with the new forest code, Law n°004/74 of January 1974, which replaced in their entirety the earlier texts, many obsolete and fragmentary. This new law laid down the basic legal foundations for Congolese forestry policy. At the time this forest code was enacted, it was considered one of the most modern in Central Africa. Even back then it called for the division of the forest domain into forest management units, or FMU, as the basic forest units for the implementation of management, conservation, reconstitution and exploitation of the forest domain. By 1980, the Congolese forest was organized into FMUs, each large enough to supply an independent timber industry. Each FMU was obliged to submit a harvesting and management plan for approval by the Ministry in charge of forests. Various projects at that time hammered out sustainable management strategies for wood resources, such as the planning and development project for southern Congo, or the southern Congo forest development project, which terminated in 1988.

Concerning artificial regeneration and reforestation, the OCF, founded in 1974, which then became the SNR in 1987, is responsible for reforestation in both natural forest and savanna areas. The UAIC is a public company founded in 1978, which became a limited company in 1990, and is mainly responsible for industrial plantations planted with fast-growing species.

From 1982-1986, forest policy, based on Law n°32/82 of 7 July 1982 embodying the new forest code, called for a greater role for the State in the form of state and semi-public companies working in the silvicultural, forest harvesting and forest industries sectors. A reverse trend began in 1987, with the government disengaging from most forestry sectors in favor of the private sector and the associations.

In 1990, The Republic of Congo began to draw up its National Forests Action Plan (NFAP or TFAP-Congo) which acknowledged the need to revise Congo's forest code. The National Environmental Action Plan (NEAP) begun in 1991 was adopted in 1995. The revised draft forest law was finally submitted to the Government for review in early April 1997, and was promulgated on 20 November 2000. Unfortunately, Congo has undergone several years of economic and political unrest and sometimes violent strife, such as the civil wars of 1993 and 1997, which have damaged the fabric of the public service organizations and bolstered the trend towards unauthorized exploitation of the natural resource base.

In the early 1990s, about 13 percent of the productive forests had genuine management plans, but very few of these were actually implemented. The area of forest plantations amounted to 57 000 hectares in 1993. By 2000, that figure had risen to an estimated 83 000 hectares, mostly in the savanna zones of the country. At present, the forest domain is divided into 34 FMUs ranging in area from 200 000 to over one million hectares. Natural productive forests currently cover an area of about nine million hectares, or some 45 percent of the national forest cover.

Criteria and indicators for sustainable forest management

Congo has adhered to several initiatives related to the elaboration of C&I for sustainable management of natural tropical forests:

- The ATO initiative called “green label” in 1993, whose goal is to promote sustainable management of forests and implementation of a reliable and independent system of forest production control, on the basis of PCI as promotion tools. This ATO initiative has been supported at the international level since 1996 by the European Union in the frame of a sub-regional project called “promotion of sustainable forest management and certification in the timber producing countries of the Congo basin”. The WWF was named the executive agency. Unfortunately, the country did not benefit from this project because of the events of 1997.
- The ITTO initiative since 1990, that has led to a C&I set for sustainable management of natural tropical forests, as well as the 2000 ITTO goal which was: “exports of tropical timber, and its derived products, must come quickly from sources managed in a sustainable way”. The inclusion of Congo in this initiative has resulted in more than 2 billion FCFA in financial assistance from the ITTO, for implementation of three projects, five draft-projects and other activities including the workshop organized in 2002 at Pokola (CIB) on the sustainable management of its forests and elaboration of C&I. Despite all of these efforts to help Congo towards sustainable forest management, the initiative to elaborate national C&I remains underdeveloped and did not experience significant progress.
- In 2000, a proposed project called “Development of ITTO C&I” was submitted to ITTO for funding. The project was approved and funded in 2001 by ITTO during its 30th session, in the form of a draft-project whose goal is to first study the applicability of ITTO C&I in sustainable forest management of the Congo and then to reformulate the project. This draft-project will end in November 2002.
- In 2002, a National Working Party was implemented in the Ministry of forest economy. The results should be released soon.

Current measures for sustainable forest management

Management objectives

The new forest law is based on the fundamental principles of sustainable, participatory forest management with the joint involvement of the public service agencies, the rural public, the private sector and NGOs. The goal is decentralized management of the forest as an ecosystem. The objectives in production terms are threefold: (i) disengagement of the state and privatization of state firms dating back to the 1970s, (ii) creating a favorable climate for private investment and increased industrialization of the sector, (iii) sustainable forest management. This new policy entailed a real upheaval, forcing the various partners to play a triple role as loggers, industrialists and managers. Sustainable forest harvesting is designed to contribute to regional development while at the same time ensuring ecosystem protection and conservation. Forest inventories are the first step, followed by the preparation and implementation of management plans for the various FMUs. Eventually, the goal is for FMUs and management plans to embrace all forests in the State domain. Additional goals are more forest plantations and silvicultural treatments for the production of service and fuelwood, increasing the area under forest and boosting yields in the productive forests. Over the next decade, UAIC has set a target of 100 000 ha of new eucalyptus plantations, mainly in the coastal area.

Concerning conservation, the constitution, development and management of a network of protected areas such as reserves and parks for ecosystem conservation and protection is to be stepped up. At present, protected areas cover some six percent of the national territory. Congo's ambition is to increase that figure to at least 10 percent.

Forest management plans
The permanent forest domain is divided into FMUs, the basic units for all work of development, management, conservation, reconstitution and production. A local administrative unit of the forest service is responsible for FMU management and execution of the management plan. This unit may also benefit from the assistance of specialized services of the central Ministry for specific work. The management plan must conform to sustainable development principles and the classification of the FMU in question. It is drawn up for a period of ten to 20 years, as specified, and revised at the end of that period.

The forestry administration also works to reconstitute forest resources through the activities of the SNR, which operates forest nurseries, and the UPARA (pilot management, reforestation and agroforestry units). The UPARA are operational in areas where harvesting has already taken place. Areas identified as impoverished are thus enriched with high-value species.

Silviculture
The main species planted in rainforest areas are okoumé (*Aucomea klaineana*), limba, bilinga (*Nauclea diderrichii*), moabi (*Baillonella taxisperma*), pao-rose, (*Swartia fistuloïdes*) and tiama (*Entandrophragma angolense*). Species planted in savanna areas are pines (*P. caribaea, P. oocarpa), Eucalyptus* spp., *Araucacia* spp. and *Acacia* spp.

Congolese forestry silvicultural research has obtained some impressive results with selected local species, especially limba; with fast-growing exotics, mainly Eucalyptus and pines; and with industrial plantations of these species. Eucalyptus cloning techniques with fast-growing *Eucalyptus* spp had already been developed by 1976, and were later extended on an industrial scale. Limba, a sun-loving species, has been used since 1949 following the partial or total destruction of the forest by manual or mechanized methods. Plantation spacing can be as wide as 12 m x 12 m.

Natural forest improvement is also practiced in the Congo. The forest cover is opened for the first time by commercial harvesting. Complementary selective thinning of the dominant secondary species follows immediately to favor the growth of the dominant commercial species. This mixed regeneration/shelter cut is also intended to stimulate the long-term regeneration of commercial species.

Forest conservation measures
The establishment of protected areas in the Congo dates back to the 1935 founding of Odzala National Park. Congo has since strengthened, legalized and expanded the network of protected areas. In 1988, a Unesco/UNDP project led to the establishment of the Dimonika biosphere reserve, the first of its type in Congo. A second park, Nouabalé-Ndoki National Park, followed in 1993. There are also several wildlife reserves where hunting is totally banned, hunting reserves where hunting is allowed with a permit and sanctuaries. The total amount of land covered by protected areas is now something over 2 million ha, including 1.3 millions hectares of forest land, or some six percent of the national territory. The wildlife and conservation administration comes under the Ministry of Water Resources and Forestry.

Congo's target of putting at least ten percent of its territory under protected areas will not be attained unless the existing protected areas are better-managed and better-enforced so that the wildlife sector can quickly develop into a basic pillar of tourism development in the country. New legislation now in the pipeline will enable the sector to adapt to the current needs of conservation, effectively combat poaching, and ensure the proper development climate.

Congo is now addressing the issue of conserving its biodiversity, particularly through its membership in the Organization for Wildlife Conservation in Central Africa (OCSFA) and the Conference of the Central African Moist Forest Ecosystems (CEFDHAC). The Network of Protected Areas in Central Africa (RAPAC), an associative structure founded on 30 May 2000 in Yaoundé by the administrations in charge of protected areas in seven Central African countries (Cameroon, CAR, Chad, Congo, Equatorial Guinea, Gabon and Sao Tomé and Principe), has a Congo component in Odzala National Park.

Forest protection measures
In the matter of fire protection, Law 16/2000 of the 20th of November 2000, stipulates that "throughout the forest, it is forbidden to start or abandon a fire. Anyone who finds a forest fire or a fire susceptible to spread into a forest, must try to put it out or report it to the nearest local authority, who then, must make all necessary arrangements. The agent(s) of the local administrative authority, or in absence of them, the local Water and Forest Department representative, can require the local villagers and/or anyone else in the area to fight the fire. The Water and Forests Minister, through a Decree, has planned prevention measures against forest fires and has prepared intervention plans for forested areas presenting fire risks.

In the matter of protection and follow-up of the state-owned forest, the administration of water and forests are responsible, according to the management plan at national, regional and local levels, that the authorized activities in this area don't lead to the forests destruction, but assure their sustainability, their extension and harvesting in rational conditions. These activities must be carried out in the framework of rational management of forest resources, on the basis of sustainable management of forest ecosystems, assuring a sustainable forest yield and environment conservation, notably in regards to biological diversity.

All activities in the forestry field that do not conform to the clauses of the above mentioned Law and to the rules for its enforcement, constitute an offense and leads to a penalty (e.g., pasture lands in unauthorized areas, agriculture in the forest, forest fires, etc.).

Forest harvesting practices
The rainforests have a very high timber potential, made up in part of high-value red woods. Selective forest harvesting is centered on okoumé, sapelli (*Entandrophragma cylindricum*), sipo (*E. utile*), niové (*Staudtia kamerunensis*), limba, bilinga, moabi, iroko (*Milicia excelsa*), tiama and longhi (*Gambeya* spp.). Generally speaking, forest harvesting rates are far below the annual marketable potential which is estimated at 1.4 to 2 million m³ of logs/year, considering natural reconstitution of forest resources over felling cycles of 30 to 50 years.

The 1974 forest code stipulates that management plans are to allow selective cutting of trees at least 60 cm in diameter with felling cycles of 25 years, which is the minimum time needed for 40-60 cm trees to mature into harvestable trees 60-80 cm in diameter. Harvesting is subject to three-year felling authorizations stipulating the maximum target areas and minimum timber volumes to be produced. A limited, selective elimination of non-commercial species, planned to favor the regeneration of high-value species, has not yet been implemented on an operational scale.

Under the new forest code, the management plan specifies the species selected for felling, the specimens to preserve, silvicultural treatments and the silvicultural calendar of operations for each plot scheduled for production, bearing in mind, where applicable, the area's potential for production other than wood, such as game or forest plants of interest as food, pharmaceutical, or other products. Harvesting in a domain forest or FMU for which a management plan has not yet been approved is to be preceded by a determination of the maximum annual felling volumes allowed over a specified area and for inventoried species.

Public participation in forest management
The State long held a monopoly over forest resource management in the Congo. The recent institutional reforms initiated in the Central African countries have drawn some of their inspiration from the village forestry approach, in response to the decision to decentralize forest management. The new forest law in the Congo thus defined the communal or community forest as that forest so classified by decree in the Council of Ministers. A communal forest may also be defined as such where the community has planted trees on land belonging to it or where such property has been transferred to said community from the State. Communal and local community forests, or those belonging to other territorial units, then become the private domain of the groups in question.

The management plan of a unit belonging to a local community or territorial unit, is submitted to the forestry administration by the community for approval. The community is responsible for implementing the plan under the supervision of the forestry administration. Forest products of any kind resulting from the exploitation of local community forests are the exclusive property of said community, in accordance with the usage rights in force.

Special programmes and incentives to promote sustainable forest management

The Republic of Congo belongs to several regional and international organizations such as ITTO, CITES, IUCN, ATO and CEFDHAC, all working to some extent and in some capacity in sustainable forest management. The country has also signed or ratified a number of conventions, such as the conventions on biological diversity, climate change, protection of the world cultural and natural heritage (World Heritage Convention), etc. This is a clear expression of the political will of the Government to work for more sustainable management of Congolese forest resources.

The incentives-based economic alternatives approach is increasingly in use on the ground, particularly with respect to salary payments and sharing the economic benefits of projects, especially those derived from tourism. Even though the country has substantial attractions from the standpoint of tourism, the sector in general and ecotourism in particular has remained underdeveloped. This is partly because there is no tradition of tourism, the cost of providing tourist infrastructure is very high, and the lack of such infrastructure is near-total. What little has been done is due to ECOFAC, the EU-financed pilot regional program for the conservation and rational use of forest ecosystems in Central Africa, which combines conservation and rural development. Launched in 1992, ECOFAC has a Congo component in Odzala National Park. Tourist activities, based on the viewing of rare or spectacular species, began in 1996 but were unfortunately interrupted in 1997 due to the situation of civil unrest. Since 1995, FPTF (the Future of People of the Tropical Forest) has provided support for a number of sustainable management, conservation, development and planning projects, especially ECOFAC projects.

Concerning ecotourism, the Lossi forest in northern Congo is one example of a pilot participatory management project where the villagers themselves asked to have their traditional grounds designated as a gorilla sanctuary. Also at the regional level, CARPE (the Central African Regional Programme for the Environment) is present in every country in the Congo Basin, working to combat deforestation and the loss of biodiversity. REIMP, the Regional Environment Information Management Programme, aims to boost the circulation of environmental data and enhance the results of existing projects with an information component in the sub-region.

Unesco and UNDP both contributed to the establishment of the Dimonika Biosphere Reserve in 1988. Conservation and biodiversity efforts, especially by USAID, the GEF, and IUCN, particularly for wildlife, include the Conkouati Wildlife Reserve and Nouabalé-Ndoki National Park.

A country-wide management experiment called UPARA has been underway for some years now. This is a partnership programme linking the Ministry responsible for forestry and logging companies. It works within the logging concessions to establish forest nurseries, reforest with local species, run agroforestry trials in farming areas, and set up natural regeneration observation plots and village plantations, among other things. The UPARA-CIB was formed in 1996 after an agreement signed by the Ministry of Forestry Economy and the General Directorate of *Congolaise industrielle des bois* (CIB) concerning sustainable management in the Sangha forests. A pilot study by FAO in cooperation with a private firm, SOCOBOIS, *Société congolaise des bois*, set out to review the field applicability of FAO's model code of forest harvesting practices.

In line with the new forest code, a national forest inventory is also planned, along with a new public service to be established for this purpose within the forestry administration. It will also be responsible for drawing up forest management plans throughout the country. The forestry administration also plans incentive measures to enhance the added value of forest resources through a graduated tax on exports, diminishing in accordance with the extent of processing.

Trends in forest management

Forest management, long based on annual, area-specific, limited-duration harvesting plans now features a multi-resource, multi-sided and participatory approach. The application of the 1974 forest code enabled the Congolese authorities to establish a strong government sector with a centralized and highly structured forestry administration. In the aftermath of state disengagement from the productive side in the early 1990s, the private sector assumed a much wider role, and production is now entirely in the hands of private firms. Implementation of the new policy is based on integrated and sustainable management of forest resources, with participatory management involving the public sector, rural people, the private sector and NGOs. One striking feature in recent years has been the political will to decentralize forest resource management, and the subsequent decision to establish new forestry legislation. The restructured forestry administration is expected to reinforce the capacity of regional forestry administrations to intervene, and at the same time lead to a better understanding of existing forest resources. The trend in forest production is to increase production by restructuring public firms and creating small and medium-sized enterprises and industries as an integral part of core development areas.

Key issues and concerns

The rate of deforestation is very low in the Congo, indeed one of the lowest in the African rainforest belt. Locally, however, there are wide areas of deforestation, especially in the more densely populated southern part of the country. Reduced plant cover quality can be traced to several decades of overharvesting for timber, shorter fallow periods in shifting cultivation, overhunting, brushfires, and deliberate burning. The former intensive exploitation of southern Congo's forests may well lead to a scarcity of specific species in the short term. Reforestation of the natural forest to reconstitute degraded areas is still lagging far behind the need, given the huge financial effort involved. The savanna areas nonetheless offer a fertile terrain and immense future potential for the creation of artificial forests. The state of conservation of Congo's protected areas is quite worrying. Problems in these areas are numerous. Without listing every one, forestry service staff are poorly equipped, poorly-trained, too few in number and too deficit in the necessary resources and logistical support to effectively monitor activities and enforce regulations in their areas. Hunting and poaching for bushmeat are prevalent in concessions awarded in and around the reserves for mining and forest operations.

Understanding of the resource base is weak. The various forest inventories carried out in the Congo cover only part of the productive forest domain and are mostly old and obsolete. No countrywide forest inventory has been made as yet. Much has been learned in the forest research sector, but the data has often not been acted upon. This is partly due to institutional weaknesses, but also and above all to the lack of a specific policy and strategy framework.

Despite the revision of the legal framework and the reorganization of production, there are still various gaps in programme implementation. The main shortcomings concern a clear grasp of timber potential, the preparation and implementation of management plans, processing, the awarding of forest concessions, and the recovery of fees and taxes. It is very difficult to enforce management plans in the field, mostly due to weak institutional capacity within the national forestry institutions, technical problems and a certain failure to adapt to local socioeconomic conditions. The FMU system in the Congo might well have provided a solid foundation for a sustainable forest industries, but what was not taken into consideration was the lack of field staff to monitor the FMUs, the state monopoly over the forest domain, and, lastly, forest planning which up to now tended to exclude other relevant interests, such as conservation.

The country has gone through a decade of economic and political emergencies, including episodes of violence such as the 1993 and 1997 civil wars, which have disorganized the public services and furthered the unauthorized exploitation of Congo's natural resources. The outcome of the above considerations hinges upon the consolidation of social peace and the establishment of democratic, stable and enduring national institutions.

2.7. Democratic Republic of Congo

2.7.1. Legal and institutional framework for sustainable forest management

Legal framework

Until such time as new forestry legislation is enacted by the Democratic Republic of Congo (DRC), Congolese forest management is implemented in accordance with the Forest Law of 11 April 1949. It contains the basic legal framework for forest law, and is made up of 46 articles divided into four categories: background, forest regime, indigenous forest usage and exploitation rights, private forests, and penalties. This 1949 law, applied in the spirit of the 1966 Bakajika Land Law, the 1973 Land law and the 1980 revised Land Law (Law n°80/088), stipulates that the forest belongs to the State and that only the State is entitled to allocate a portion of this domain to third parties for exploitation in accordance with a contract drawn up and signed by the two parties. There is no private forest domain in DRC, and any investment in the sector is subject to rules established by the Ministry in charge of forest management. Rounding out the original law are a number of updated texts, bearing mainly on forest harvesting and compiled under the "Guide to Forest Exploitation" Interdepartmental order n°01059 of 22 October 1975 regulates log exports. The first five-year development plan of 1986-1990 also stipulated priority strategies for each economic sector, and most are still valid today. A new draft forest law prepared in 1979, and later revised and amended in 1989, has not yet been ratified. It introduces a new classification for forests and includes the participation of local people in forest management. Lastly, the Tropical Forests Action Plan (TFAP/Zaire), formally adopted in 1990, aimed to define both a national forest policy and plan.

Forest institutions and forest managers

The State is the sole owner of the land and subsoil. Despite this, the amended land law of 1980 does allow customary authorities the prerogative of usufruct.

Ordinance n°75-231 of 22 July 1975 established the Ministry of the Environment, Nature Conservation and Tourism. Today, this has become the Ministry of the Environment, Nature Conservation, Fishing and Forests. Its mandate covers environmental protection, the conservation of nature, the forest sector (forest harvesting) and the fish and game sectors. The Ministry works through its main services and directorates, such as the Directorate of Forest Management and Game, which is responsible for monitoring forest harvesting and hunting activities. The *Service permanent d'inventaire et d'aménagement forestiers* (SPIAF) is responsible for forest management plans, forest inventory, and research and development The Directorate of Natural Resource Management (DGRN) is responsible for the normative aspects of forest management and for resource allocation. The National Reforestation Department (SNR) is in charge of reforestation work. The fund for the reconstitution of the forest capital (FRCF) serves to finance projects having to do with forest management and forest resource reconstitution. The National Centre for Environmental Information (CNIE) is responsible for environmental data collection, accumulation and enhancement. The Permanent Secretariat of the Inter-Ministerial Committee on the Environment is responsible for coordination with environmentally-linked work in other ministries.

Concerning conservation, the Department of the Environment, Nature Conservation and Tourism is responsible for protected areas management and for the National Institute for Nature Conservation (INCN), which in 1975 became the Zaire Institute for Nature Conservation (IZCN), and subsequently the Congolese Institute for Nature Conservation (ICCN). The Institute of Zoological and Botanical Gardens (IJZBC) is responsible for *ex situ* conservation.

The National Institute for Agricultural Research and Studies (INERA) has also carried out agricultural research in Congo, in addition to forestry research prior to the establishment of the Ministry in charge of forests. Following INERA's work in the forestry sector, SPIAF undertook research and development work in accordance with its mandate. Since 1998, the DRC has been home to a post-graduate regional school for integrated management in tropical forests (ERAIFT).

The main role of the private sector concerns harvesting forest resources for profit, and forest regeneration in forest concessions. Commercial logging companies are, however, believed to have halted work due to the war. As for NGOs and other associations, their role is confined to the development of rural forestry activities and to awareness-building among rural communities in various areas, such as agroforestry.

2.7.2 Status and trends in forest management

History of forest management and silviculture

The first forest plantation was established in 1905 with *Terminalia superba*. The era of industrial logging began in 1924. The first tree plantations intended for timber production date from 1933. The technique at the time was reforestation for production purposes in natural forest through enrichment planting with high-value species and also protection afforestation with such species as *Pinus, Eucalyptus, Cupressus, Grevillea* and *Acacia*. In the savanna zone, large areas were planted with Pines and Eucalyptus to serve the public need for fuelwood and service wood, and to supply the mines.

During the 1940s, the then forest service developed an agroforestry system based on banana production. Up until 1975, many plantations were established throughout the country for various purposes such as erosion control and the supply of fuelwood and service wood, especially in the provinces of Kivu, Orientale, Katanga, Kasai-Occidental, Bandundu and Mayumbe.

Between 1960 and 1977, the State withdrew from reforestation activities, which were entrusted to the logging companies under the "He who deforests, reforests" principle. The only notable intervention from that time was the FAO/UNDP programme from 1967 to 1973 which led to the afforestation with fast-growing species of several hundred ha in the immediate vicinity of Kinshasa. The 1970s were marked by mounting pressure on the forests by people looking for land to farm and fuelwood. Measures to promote reforestation have nonetheless been adopted since 1978, such as the resumption of direct state intervention in the sector with the establishment of the National Reforestation Department.

In the early 1980s, the Government opted for income and currency diversification in the wake of the decline of the mining industry. Interest in the forest as a productive sector that could drive economic development mounted at that time. Several events from that period acted as precursors to the formulation of a national forestry policy: a national symposium held in 1984 which laid down the general objectives and principles of Congolese forestry policy; the institutional review of the forest sector in 1987 by the International Institute for Environment and Development, which was intended to identify constraints linked to the forest sector; a national seminar on forestry policy held in 1988, and the preparation of the TFAP-Zaire in 1989-1990. In December 1984, the President of the Republic also announced the establishment of a fund to reconstitute the forest capital (FRCF), which was set up to finance reforestation and management activities throughout the country.

The 1990s were marked by civil conflicts, some quite violent. The pillaging that took place in 1991 wrecked the economic fabric of the country, the socioeconomic infrastructure dissolved, cooperation was suspended, and unemployment rates shot up. This situation was exacerbated by major population displacements of people from neighboring Rwanda in the wake of the troubles there, and a major influx of refugees in the eastern part of the country. The civil war which has gone on since 1998 has had the unhappy consequence of thoroughly destabilizing the forest sector.

Criteria and indicators for sustainable forest management

NO AVAILABLE DATA

Current measures to promote sustainable forest management

Management objectives

A major objective of national forest management policy is to promote forest harvesting on the basis of sustained yields backed by efficient forest industries so as to enhance the contribution of the sector to DRC's socioeconomic development. The following targets have been set to meet these objectives: gradually increase timber production, install efficient forest industries to increase the added-value of forest products, build the basic infrastructure for the removal of locally processed products, ensure the political will to create a climate of trust, offer incentives to attract private investment, implement forest inventory and management programmes, including reforestation, and, lastly build institutional capacity for management, research and training.

The amount of land allocated annually to logging companies is currently under 100 000 ha. The figure for 1996 was 87 924 ha, 87 555 ha in 1997 and 68 609 ha in 1998. Of this amount, 98 percent was allocated for industrial logging and only two percent for crosscut sawing. The objective for fuelwood production is to establish fuelwood plantations and ensure rational resource use so as to ease the pressure on the forest. As for forest ecosystems, the objectives concern the protection of endangered wild plant and animal species, the expansion of protected areas to cover 15 percent of the national territory, the involvement of local people in protected area conservation and management, and the development of ecotourism.

Forest management plans

Of all existing plantation areas – there were 97 000 ha in the year 2000 – only about four percent have actually benefited from intensive forest management, involving silvicultural treatments and management plans. At the present time, and with the exception of the work of SPIAF which has produced several management plans for natural forests, there is no intensive forest management in the DRC. Management plans or plans for forest resource utilization have nonetheless been prepared for each forest formation based on the results of forest inventories, i.e., the Mayumbe forest, the southern Shaba woodlands, the equatorial forest (Bandundu) and dense montane forest (Kivu). These plans involve zoning and allocation of the territory, annual allowable cut for timber harvesting for the main species logged based on forty-year cycles, an annual forest enrichment planting programme for high-value species, a promotion programme for complementary species which currently represent the bulk of standing volumes, the resumption of incentive measures with respect to both State fees and taxes and local processing and utilization of forest products, a strategy to meet the public need for fuelwood through the recovery of logging and processing residues, plus fuel-saving measures such as improved cookers, the establishment of protection afforestation for vulnerable and degraded sites, as well as game and tourism development. It must be pointed out, however, that none of these management plans have actually been applied in the field.

Silviculture

Various natural regeneration studies have led to certain conclusions about operations to promote seed-trees, such as vine removal, clearing and so forth, which can multiply seeding by an average 100 to 400 percent. The cover afforded by shelter wood also favors natural regeneration. A number of planting techniques have also been tested, such as standardization from the ground up, strip methods, row-planting, the plot method, planting in full sunlight, etc. *Terminalia* spp. are among the main timber species planted for industrial purposes. *Eucalyptus* spp., *Acacia* spp., *Pinus* spp. and *Gmelina arborea* tend to be used for fuelwood, as well as for soil protection.

SPIAF has also done research on improving forest resource management in the outlying areas around cities and towns, which are under severe threat from overexploitation. The work concerned simple coppicing for immature secondary forest, with clear felling of the plot in question to promote the establishment of stump sprouting and suckers, the coppice-with-standards (shelter wood) treatment in mature secondary forest, release cutting and vine removal in forest fallow to promote standing stock growth, and enrichment planting (reforestation), either as an agrosilvicultural technique or as full planting. Natural reconstitution *via* integral protection of savanna zones and experiments on restoring forest cover by means of full reforestation or agrosilvicultural techniques were additional techniques.

Forest conservation measures
Prior to independence in 1960, protected areas were established in accordance with a royal decree dating back to 1937. The current legislation on protected areas consists of the 11 April 1949 forest law and Law n°69-041 of 1969 concerning nature conservation. Soil and water conservation in the DRC is regulated by the 26 November 1958 Decree Law.

Concerning biodiversity and ecosystem sustainability, the Government made a commitment in May 1995 to follow the biodiversity recommendations of the 1992 Earth Summit in Rio. DRC's white paper on biodiversity was prepared and adopted for this purpose in 1997. Subsequently, and based on this paper, the Strategy and Plan of Action for the sustainable use of biodiversity in the DRC were designed and formulated, and the general report on this work adopted in February 1999.

Protected areas consist of 10 national parks, totaling over 10 million ha in area (including 9.3 million ha of forest), four of which are listed as UNESCO World Heritage Sites. The DRC also has three biosphere reserves totaling nearly 300 000 ha in size, managed under the supervision of the National MAB (Man and the Biosphere) Committee, five botanical gardens covering 100 000 ha and 57 hunting reserves of around 10 000 000 ha, of which only 21 have been maintained in recent years by the Congolese Institute for Nature Conservation. The Ministry of Environment has also carried out reforestation efforts as erosion control measures.

Forest protection measures
NO AVAILABLE DATA

Forest harvesting practices
The Government is not directly involved in forest exploitation in the DRC, and therefore there are no public logging companies. Logging companies operate in a private capacity on public concessions leased by contract. Anyone exploiting the forest must be authorized by the State in the form of a felling permit for forest harvesting on the concession in question. Forest harvesting is regulated by two legal procedures. The first is small-scale logging using cross-cut saws, for which a simple felling permit is sufficient and with no compulsory reforestation. The second is large-scale industrial logging, basically for export.

Allocation follows a three-stage procedure. First, the survey authorization granted to the authors of a forest harvesting proposal after a notice of vacancy posted by the competent authority in the province to which the proposal refers. This is valid for one year, during which the company filing the request is required to carry out an inventory of the concession at its own expense. The next step is the letter of intent, a contract signed by the lease and the Congolese Government once the lease has completed step one. It is valid for three years, after which the lease is bound to implement at least half of its investment project. At step three, the guarantee of supply, valid for 25 years and renewable, is granted to the lease, which must have at least one viable wood processing unit.

The maximum concession size that the Ministry in charge of forests may allocate is 250 000 ha. Felling, which is allowed during the last two steps, requires the possession of a permit delivered upon completion of a harvesting inventory of the area covered by the proposal. The forest potential of said concession is identified at that time and the allowable annual cut is established for each target species or group of species. The maximum allowable cutting area is 1 000 ha and a logging company may request as many as it wishes, in accordance with true capacity. Once the concession is in the hands of the leasing company, the company is bound to respect the harvesting rules spelled out in the contract. In addition, any holder of a felling permit must, at the close of each quarter, submit to the competent department a declaration of volumes felled. To ensure forest resource sustainability, loggers must respect the departmental provisions laid down in the Guide to Forest Exploitation (latest edition 1986).

Forest harvesting in the DRC is selective. The principal species exploited are *Afzelia pachloba, Diospyros crassiflora, Entandrophragma angolense, Entandrophragma candollei, Entandrophragma cylindricum, Entandrophragma utile, Millettia laurentii, Terminalia superba,* and so forth. In the case of timber for mining purposes and for charcoal, clear-felling is the practice in harvest areas. Reforestation the following year accompanied by a five-year reforestation plan is compulsory.

A permit is also required for gathering minor forest products. The export of any such products requires an export license, which is issued by the Ministry in charge of forests.

Public participation in forest management
The legislation covering the installation of logging operations on Congolese territory requires the company filing for a permit to include a "social improvement" component in their proposal. This is intended for the benefit of local people, and not solely for those employed by the company. In compliance with this law, logging companies which have worked in the country since colonial times have built socially beneficial infrastructure such as housing, schools, hospitals, clinics, and so forth, in their target areas for the benefit of the local people. The Congolese Government's forest management policy is also designed to preserve the benefits of the forest sector for indigenous people. In accordance with the 11 April 1948 forest law, it acknowledges, subject to appropriate rules, user rights of indigenous populations over the resources they need in protected, indigenous or domain forests. Greater public participation at all stages of the management process is needed, however.

Special programmes and incentives to promote sustainable forest management

The DRC is a signatory to several conventions and agreements concerning environmental management. In compliance with the recommendations of the first Earth Summit held in Rio in 1992, an interministerial coordinating and follow-up committee for the Rio decisions was formed with the mandate of drawing up Congo's white paper on biodiversity and implementing the National Environmental Action Plan (NEAP). Unfortunately, due to chronic political instability over the last ten years, this committee has been unable to perform as planned. The National Forest Action Plan was formulated in accordance with TFAP (1990), NEAP (1996), and the National Strategy and Biodiversity Action Plan (SNPA-BD of June 1999). The first national report on progress in implementation of the Convention on Biodiversity was published in 2000.

Concerning the Convention to Combat Desertification (CCD), a national action plan is also under consideration. A national forum on forest policy with the major theme “harmonious and sustainable forest development” was also held in May 2000. It is expected to lead to the formulation and adoption of a national forestry policy attuned to the present-day context.

Incentive measures such as new legislation and forest allocation procedures, plus lower export taxes and simplified procedures to promote exports, have been put in place to develop the timber industry. Incentive measures have also been adopted to attract fresh investments that will modernize the forest industries and heighten competitiveness on world markets.

For the fuelwood sector, charcoal-making techniques have been developed and extended and improved, fuel-efficient cookers distributed to reduce fuelwood consumption.

At the regional level, there are a number of ongoing programmes such as REIMP, the Regional Environment Information Management Programme, with the National Centre for Environmental Information (CNIE), launched in June 1998, working to achieve REIMP’s objectives. CARPE, the Central African Regional Programme for Environment, is working in all Congo Basin countries to counter deforestation and loss of biodiversity. The DRC component of ECOFAC was set up to enhance management in Salonga National Park and its buffer zones. But, like the implementation of TFAP in Zaire, this project has been unable to take off in the ongoing climate of political instability.

Trends in forest management

Forestry policy recently developed in the DRC is designed to intensify and harmonize the mounting (and apparently conflicting) demands for forest resources, by reconciling conservation with development. The major guidelines underpinning DRC’s national forestry policy in the 2000s are the integration of the forest sector in rural development planning, combining conservation with sustainable development, developing the wood and wood products industries, and enlisting public participation by involving rural people in forest activities and decision-making.

The current trend is therefore to encourage industries with processing units by guaranteeing a steady supply of raw materials. Industries lacking processing capacity are gradually slated to disappear from the scene. The Government is leaning more and more towards participatory forest management to involve all stakeholders in the exploitation of forest resources.

Key issues and concerns

The main pressures on DRC’s forests come from forest exploitation for timber, service wood and fuelwood, from shifting cultivation on slash/and/burn, from the growth of urban centres, from the harvesting of minor forest products and from new development infrastructure. Increasingly, the fact that trees are being virtually mined in unauthorized fashion in forest zones is causing widespread degradation. Protected areas are particularly prone to the encroachment of people living nearby and looking for land to grow food, wood for fuel and game to feed themselves and their families.

The knowledge base on both natural and artificial forests is scant and often dated, for lack of the necessary financial, human and material resources. We shall not attempt to list every problem and constraint, but major gaps are the lack of coordinated action in the absence of planning, weak institutional capacity, incomplete and frequently obsolete legal texts, a failure to address local peoples' concerns in project planning, misapplication of laws and standards, and more. In the last few years, however, the Government has firmly expressed willingness to strengthen forest institutions and build national capacity, but is handicapped by a severe lack of funds. Forestry staff are also few and poorly trained.

Moreover, due to the severe lack of funds, existing plantations have not received the needed maintenance, and remain exposed to acts of vandalism. It is very difficult to give any hard and fast figures on the area of existing plantations in the DRC, or on how they may have changed over time, due to the difficulties encountered by the forest and/or reforestation services in gathering reliable information on the sector. The same problem arises in identifying the extent of felling within existing plantations, none of which is official. State monitoring and enforcement of harvesting rules in the natural forests also suffer from the same weaknesses.

The political situation in the country, characterized by conflict and crises since 1990, has contributed greatly to the slowdown in the forestry sector. For this reason the DRC attracts few investors and is not currently receiving any form of external cooperation. In such a context, it is difficult to implement a sound programme of sustainable forest management.

2.8. Equatorial Guinea

2.8.1. Legal and institutional framework for sustainable forest management

Legal framework

Until quite recently, there was no legal framework for forest management in Equatorial Guinea. Prior to the enactment of the first forest law in 1981 (n°14/1981), forest legislation was outdated and highly dispersed, consisting of decree and administrative laws adopted prior to independence in 1968. The 1981 forest law defined three forest categories: state-owned, communal and private. It also covered conservation and wildlife management, with regulations concerning the National Parks. Other laws on the environment, forests and wildlife were enacted in 1988, especially Law n°8/1988 of 31 December 1988, which dealt with protected areas, hunting and wildlife. This was the first law to take up the protection of endangered natural areas. It established a temporary network of protected areas and also regulated hunting activities.

Law n°3/1991 of 4 April 1991 abrogated Law n°14 of 1981. It regulates the use of natural forests, hunting and wildlife. Its specific provisions cover forest resource extraction and management, plantations and afforested areas, ecosystem conservation, the transport and marketing of forest products, monitoring infractions, and sanctions. It thus lays the legal, economic and administrative groundwork for rational, sustainable forest management and conservation.

Law n°1/1997 of 18 February, currently in force, replaces Law n°3/1991. It concerns forest utilization and management. Its accompanying Decree Law n°97/1997 determines forest utilization and management. It ensures the sustainable use of forest resources and spells out the legal, economic and administrative aspects. It classifies and defines forests and forest products, the management of forest resources, ecosystem conservation, resource promotion, transport and marketing, monitoring infractions, and sanctions. In 1999, the National Forest Action Programme was formulated. Law n°4/200 of 22 May 2000 deals with protected areas and their management in Equatorial Guinea. This new law designated 13 zones as protected areas.

Forest institutions and forest managers

There is no private ownership in Equatorial Guinea: forest resources are managed by the Ministry of Forests, Fisheries and the Environment (*Ministerio de bosques, pesca y medio ambiente*), established in 1999 to direct, execute and oversee implementation of forestry, fisheries and environmental law, and to enhance production in these sectors. It is also responsible for the conservation, management and rational use of natural resources for sustainable economic development.

The Ministry has several implementing agencies, including the technical directorates of waters and forests, fisheries and environment, a regional department for forestry, fisheries and environment, provincial departments and district technical and administrative units. The forest ranger corps (*Cuerpo especial de la Guardería forestal*), under the same ministry, is responsible for forest supervision (Decree Law n°56/1991 of 22 July 1991).

The General Directorate of Waters and Forests (*Dirección general de aguas y bosques*) comprises four services, including the Hunting and Protected Areas Service (*Servicio de Caza y Areas Protegidas*). The Directorate has the ultimate responsibility for resource management, exploitation and conservation. It deeds harvesting concessions and handles all aspects of wooded area management. The Office of Supervision, Information and Promotion of Forest Species (*Oficina de control, información y promoción de las especies forestales*, OCIPEF), was set up in 1989 under the above Ministry. OCIPEF is the office responsible for coordinating, supervision, marketing, evaluation and classification operations in wood production. It is also responsible for the promotion, monitoring and control of wood exports.

In 1993, FAO and UNDP assisted the Government of Equatorial Guinea in the preparation of a planning and coordination unit (Project "*Asistencia preparatoria para el programe de apoyo para el desarrollo del sector forestal en Guinea Ecuatorial*"). This unit is now operational, with the technical and administrative capacity to plan, advise and coordinate all aspects of natural resource management and administration throughout the country. The 1991 forestry law established FONADEFO (fondo nacional de desarollo forestal), financed by export taxes. This fund was set up to support development activities in the forest sector. Up to the mid-1990s, most logging firms were Spanish, but Asiatic firms such as Shimmer, a branch of Rimbunan Hijau, headquartered in Malaysia, subsequently predominated, and now account for the bulk of logging operations in the country.

As for forest resource conservation and protection, Law n°6/1990 of 22 August 1990 established the National Committee for the Protection of the Environment (*Comite nacional de protección del medio ambiente*) under the above Ministry. Its mandate is to coordinate and stimulate conservation efforts in all sectors.

Forestry studies are taught at the *Universitaria d'estudios agropecuarios, pesa y forestal*, which was founded in 1993.

2.8.2. Status and trends in forest management

History of forest management and silviculture

Lowland rainforest was replaced by cocoa and coffee plantations in the late 17th century. Over 90 000 ha had been converted to cocoa plantations by the end of the 19th century. Trees have been logged since the 1920s, mainly in the coastal part of the country, with operations continuing up to the close of the colonial era in 1968. During the 1960s, plantation trials with *Aucoumea klaineana* were introduced, but the results were not promising. Due to the great expense involved, no industrial forest plantations were established. Forest projects prior to independence mainly dealt with the need to inventory resources.

Major logging activities in the 1960s came to a virtual standstill with the departure of the Spanish business sector, only to be relaunched in the mid-1970s, and then further expanded in the early 1980s with the arrival of new logging companies (though never matching the pace of the early 1960s). Forest production has doubled since 1993-1994. Large-scale, commercial forest harvesting on the island of Bioko has been banned since 1991 (Decree Law n°55/1991).

A 30-month project launched in 1988 led to the Mbini forest inventory, a pilot study, and the development of a 16 000 ha agroforestry demonstration area. The same project also produced a database with detailed data on all forest concessions, a forest management plan, and training for forestry staff. The ECOFAC Regional Programme for the Conservation and Rational Use of Forest Ecosystems in Central Africa has an Equatorial Guinea component in Monte Alén. It includes a tourism component, and ecotourism activities have since become one of the most viable alternatives for the sustainable use and conservation of Equatorial Guinea's forests. Moreover, Law n°4/2000 covering protected areas opens new prospects for the development of tourism. It designated 13 new protected areas, all of which, excepting the Playa Nendyi Scientific Reserve, are counting on tourism as an alternative source of income for local people. Accordingly, inventories are now underway in areas deemed to be of special interest for scenic or ecological reasons.

Criteria and indicators for sustainable forest management

NO AVAILABLE DATA

Current measures for sustainable forest management

Management objectives

Management within productive forests centres on replacement of volumes extracted and enriching the forest through full or partial reforestation, replacement and enrichment planting, and natural regeneration.

All productive forests on the mainland are commercially exploited, and indeed 60 percent of the country's total forest area of some 1 500 000 ha is already under concession to logging companies. Management in areas earmarked for conservation centres on maintaining representative ecosystems, conservation of ecological diversity, watershed management, erosion control, the conservation of genetic diversity, and the protection of sites of cultural, historical and archeological interest. Protected areas now cover a total of 316 700 ha. Management in multi-use areas centres on soil protection through agricultural and silvicultural practices designed to prevent soil erosion and degradation.

Forest management plans
An overall management plan for the concessions has yet to be devised. However, ongoing projects such as the CRUFE Project (Conservation and Rational Use of Forest Ecosystems) are working to define the content of a standard management plan to be submitted and implemented by logging companies. These plans are very generally based on the need to carry out precise resource inventories and to define harvesting rules to ensure resource regeneration, such as those governing felling intensity, felling cycles, and the like, as well as infrastructure planning, silvicultural practices, and so forth. Nonetheless, the forest law in force does specify that any sector subject to forest activities must have a management plan which will ensure conservation of the ecosystem. All companies and holders of concessions are directly responsible for the implementation of management plans to be periodically monitored by the forestry administration.

The same law also specifies that a share of the economic benefits generated by this activity is to be turned over to the national forest fund, FONADEFO, to finance management, promotion and conservation services and activities. An estimated 21 percent of the forest area is now operating under restrictions for sustainable timber production. Management plans for all protected areas are now in preparation following the enactment of Law n°4/2000 on22 May 2000.

Silvicultural practices
In the light of the country's high rate of forest cover and successful natural regeneration, there has been no forest planting.

Forest conservation measures
Although the Monte Alén National Park and several other parks and reserves were proposed as early as 1970, they were only recently granted official protection. Since independence and up to 1988, the system of government-established protected areas, which included the Rio Ekuka, Monte Raices and Monte Alén parks and reserves, lacked formal recognition. Law n°8/1988 of 31 December 1988 provided the legal framework for the establishment of protected areas, including national parks, scientific reserves, and wildlife refuges and sanctuaries. The current network of protected areas was thus established *en bloc* by this law. It comprises the two protected areas in Bioko, five in Mbini and the entire island of Pagalu. This is a total area of 316 700 ha, or nearly 11 percent of the national territory. Recently, Law n°4/2000 of 22 May 2000 put forth a proposal for 13 new protected areas to cover 586 000 ha, or some 18 percent of the national territory. Protected areas are managed by a service of the Ministry in charge of forests. Equatorial Guinea is looking into the question of setting up a National Institute for Protected Areas as an autonomous agency within the Ministry.

Conservation projects are a very new phenomenon in Equatorial Guinea, even though protection measures were already in place for some regions in colonial times. There have been several international forest resource projects. The "*Proyecto de Investigación y Conservación de la Naturaleza en Guinea Ecuatoria*l" was launched in 1985. Its objectives were biological research and the conservation of nature. Other past or ongoing projects concern the protection and conservation of nature (e.g., the Elephant Conservation Plan, Integrated Development and Conservation of Monte Alén, etc.).

Forest protection measures
NO AVAILABLE DATA

Forest harvesting practices
The forest industry is based in Rio Muni, where all the logging companies have their headquarters. Large-scale commercial logging has been banned on the island of Bioko since 1991. There are no logging companies there, and harvesting is solely by power saw.

All logging is now done by private companies to which the Government grants concessions for selective harvesting. The Government may award such contracts by mutual agreement or at public auctions. The length of the contract is, in principle, determined by the size of the concession. For areas under 25 000 ha, the validity of the contract is five years. From 25 000 to 50 000 ha, the five-year contract is automatically renewed after review (one to two concessions per company). For areas larger than 50 000 ha, the duration is for ten years and for areas over 80 000 ha, the ten-year period is automatically extended to 15 or 20 years after review. Concessions of whatever size entail the obligation to produce a management plan, install a processing plant, and process 60 percent of the output.

Some 70 species are exploited, mainly okoumé, andoung, tali, azobé and padouk. Forest harvesting standards are in effect, with Ordinance n°4/1989 of 9 November 1989 regulating tree-felling by loggers. No tree under 60 cm. in diameter may be felled. Some species, such as oveng, adebay and palissandre may not be felled at all, nor may loggers fell trees in protected areas. Maximum production volumes are also set by law. Nor may logging companies log the same parcel of forest anew before allowing a regeneration period of 25 years. The law also stipulates that the reforestation of production forest units must guarantee the replacement of the annual volumes felled. State inspectors work with the logging companies in the field, verifying the volumes extracted. Moreover, the land in production forests must be left forested along rivers and watercourses, and on slopes steeper than 45°. Despite this, concession management plans, though required, have been little enforced. Timber for export is heavily taxed, and there are also taxes on fuel and upkeep, These taxes and the very high cost of road-building are deemed the major obstacles to forest activity development. The objective of the National Forestry Plan, however, is to promote the development of forest activities.

Public participation in forest management
Provisions for community forests in Equatorial Guinea do not constitute a separate innovation, though they are mentioned in the new forest law enacted in February 1997. The concept of "*reservas de poblado*" was already written into the 1948 forest law. Since colonial times, community forests have gained legal status with a view to the development of local communities. Specific customary rights had already been recognized by the old legislation.

The allocation of communal forests is primarily in response to the need to provide land security and access to resources for forest dwellers. The Administration requires that simple management plans be drawn up following an inventory of the areas in question. Harvesting the communal forests then follows certain socially oriented specifications including clauses covering the local community and the logging company, which basically concern socially beneficial projects for the community. For effective public participation and an equitable share of the benefits deriving from forest operations, the Ministry in charge of forests has recently made it compulsory for logging companies to work in the public interest by providing roads, schools, clinics and the like in the areas where they are working. In addition, 70 percent of the taxes from forest production in the communal forests is given over to economic operators for projects to benefit the local communities.

In the protected areas, on the other hand, there is no legal framework to reconcile the interests of people living around protected areas. Pilot projects have made efforts in this direction such as financing facilities, reserving jobs for local people, advisory committees and the like. However, the new law on protected areas (Law n°4/2000 of 22 May 2000) does take formal notice of areas of traditional activities and includes representatives of village councils and NGOs on the advisory committees for protected areas.

Special programmes and incentives to promote sustainable forest management

The Central African countries, in cooperation with IUCN and financial support from the EU, are working to develop the ECOFAC regional programme for the conservation and rational use of forest ecosystems in Central Africa. This project is funding Equatorial Guinea's National Forestry Plan, and supporting sectors such as training and the management and conservation of forest resources. It is also helping to implement the Monte Alen National Park programme component. Conservation activities are also underway in Bioko with World Bank funding.

The FPTF (Future of People of the Tropical Forest) project launched in 1995 has worked since that time in support of various sustainable forest management, conservation, development and planning projects, emphasizing the cultural aspects, especially in Equatorial Guinea. FAO and UNDP have executed a support project for the National Forests Action Plan (NFAP) targeted at reformulating this plan, establishing a coordinating unit for the management programme and defining forest policy.

CRUFE (Conservation and Rational Use of Forest Ecosystems) began in June 1996 as an outcome of forest sector development strategy under the NFAP. It covers land use planning, establishing a national system of protected areas, and hammering out guidelines for managing production forests. It includes two technical components, the land use plan and the national system of conservation units, and two side support components, forest experimentation and training.

Various projects are exploring ways and means of enhancing local community participation in project management in the hope of offsetting the recurrent conflicts arising between the forestry administration and rural people over land and resource appropriation. These pilot projects should be expanded to cover a broader range of situations running the gamut from protected areas managed by the administration with an advisory role for local people, to protected areas managed entirely by the people living in them.

A study is now being developed under CARPE, the Central African Regional Programme for the Environment. This is a long-term regional undertaking by USAID to combat problems of deforestation and biodiversity loss in Equatorial Guinea as in the Congo Basin as a whole. The zoning plan for Equatorial Guinea (*"Proyecto de classificación el uso potencial de la tierra")* should lead to a clear definition of land and forest uses.

The objective of REIMP, the Regional Environmental Information Management Programme, is to contribute to the concerted and sustainable use of the natural resources of the Congo Basin countries (Cameroon, CAR, Congo, the Democratic Republic of the Congo, Equatorial Guinea, Gabon and São Tomé). It also aims to foster the circulation of environmental information and enhance the results of existing projects with an information component, specifically by setting up a computer network linking project partners, setting up meta-databases, and promoting national documentation centres.

Trends in forest management

The forest sector's management and conservation strategy is written into Equatorial Guinea's Tropical Forests Action Plan (TFAP) approved in 1990. The objectives of Equatorial Guinea's new forest development policy are to upgrade the forestry administration, work for rational, sustainable and diversified use of forest resources, including their protection, observe the principle of multiple use while maintaining ecological equilibrium, and aim at sustainable management of protected areas and wildlife. The trend in the forest sector is also to enhance the efficiency of forest product harvesting and marketing systems. Public participation in natural resource management is also on the upswing.

Key issues and concerns

Some major causes of deforestation in Equatorial Guinea are overexploitation, with removal frequently exceeding forest potential, forest clearing under the prevailing system of shifting cultivation with slash-and-burn and brushfires. Erosion, an ulterior consequence of these anthropogenic changes in the forest landscape, has still not received attention in the form of a nationwide programme. Nonetheless, all areas under extensive agriculture are theoretically required to maintain at least 30 percent of the land under natural forest.

The problems posed by the implementation of forest management plans are not solely technical, there are also the economic, social and political dimensions, including the techniques that need to be implemented, the environmental and socioeconomic interests that need to be considered, felling areas and cycles, the respective rights and responsibilities of all stakeholders, and so forth. Unhappily, forest and felling permits are allocated with no thought for safeguarding the resource potential.

Problems of an institutional nature only serve to exacerbate the above, for staff are in short supply and lack the proper training. The forest services are working without the necessary logistical support and this is a strong impediment to the execution of planned forest management activities. Generally speaking, protected areas are also short-staffed, especially in highly trained staff, and they also lack the necessary funding, equipment, and effective management systems to do their jobs, as they should. In theory, all protected areas should have management plans, in practice few do. This, however, is not the case for conservation/development plans already in place and enjoying technical backing and international funding. Such plans are in the pipeline or in the final stages in Monte Alén National Park. Generally speaking, the boundaries of protected areas are not respected, with surrounding populations crossing into and even living within these areas. Recurrent conflicts between the forestry administration and rural people over land and resource appropriation arise out of a lack of confidence on the part of the State that local communities are in fact capable of sustainable natural resource management, and out of the failure to take account of the rights of rural dwellers over the forests in which they live. In the field, putting the community forest concept into practice consistently runs aground on the definition of communities, the problem of establishing forest boundaries, and the preparation of simple management plans, a general requirement of the administration following a survey of the areas in question.

2.9. Gabon

2.9.1. Legal and institutional framework for sustainable forest management

Legal framework

Forestry activities, initially regulated by Law No. 1/82 of 22 July 1982 (referred to as the inland waters and forests framework law) is now covered by a new forest code voted into law in December 2001 by Parliament. In 1993, the National Assembly also adopted environmental protection Law n°16/93, aimed primarily at sustainable natural resource use and conservation, safeguarding and enhancing the quality of life, promoting new values and income-generating activities in connection with environmental protection, and linking development to environmental protection. The major reforms within the new forest code concern sustainable forest management, logging, industrialization of the sector, participatory forest management (community forests) and sustainable management of protected areas. It stipulates the need to include permits for activities on state-owned forest lands, including the requirement to submit a forest management plan accompanied by an industrialization plan. A national forest fund is to be set up to maintain sustainable management practices.

Forestry and management institutions

The forest code divides national forest domain into two distinct subsets: the permanent sector consisting of listed productive forests; and state-owned rural forest areas consisting of land and forests for which usufruct is limited to local communities. Community forestry comes under this category.

Management of the national forest domain is the responsibility of the Ministry of Forest Economy, Inland Waters and Fishing, in charge of the Environment, (MEFEPEPN), which, in cooperation with other ministerial departments deals with the constitution, demarcation, conservation, management, reforestation and harvesting of domain forests. The Ministry is also responsible for classification, studies, and monitoring of protected areas. The General Directorate of Waters and Forests (DGEF) works to promote countrywide, sustainable, national forest management. One major DGEF activity is the management of deeds to log the forest. The Directorate of Forest Inventory, Management and Regeneration (DIARF) is responsible for monitoring programme execution for the national sustainable forest management programme. Wildlife reserves, monitoring hunting activities and protected area management are administered by the Directorate of Wildlife and Hunting (DFC).

The Ministry of Forests has set up a planning, monitoring and evaluation unit to streamline the implementation of this strategy, ensure smooth planning of the Ministry's activities and projects and provide regular monitoring of operational activities.

The Ministry of Higher Education and Scientific Research brings together most disciplines concerned with forestry research in Gabon. Forestry research is coordinated by the National Centre for Technological and Scientific Research (CENAREST), which divides the execution of its activities among five research institutes, two of which are particularly relevant to forests and the environment. These are the Institute for Agricultural and Forestry Research (IRAF), for silviculture and artificial and natural regeneration of forest stands, and the Institute for Research in Tropical Ecology (IRET), mainly for plant and animal biodiversity.

As for training, the only high-level forestry training institute in Gabon is ENEF (*Ecole nationale des eaux et forêts*), the National Forestry School.

Excepting individual national logging firms with productive areas not exceeding 5 000 ha and small leaseholders, logging is mainly in the hands of three groups of (basically European) operators which dominate the sector. These are Rougier.Gabon, EFG (*Compagnie forestière du Gabon*), Leroy-Gabon, CEB-Groupe Thanry (*Compagnie équatoriale des bois*), *Société de la Haute Mondah* (SHM), *Société des bois de Lastourville* (SBL), LUTEXFO-SOFORGA, and a few southeastern Asian companies such as the Groupe Rimbunan Hijau. Some of these companies have also worked on the management aspects of their logging concessions and on product certification.

The *Société Nationale des Bois du Gabon* (SNBG), established in 1975, and which until recently held an absolute monopoly over log exports of the two main species (okoumé and ozigo), is a joint-stock company with state funding and private management. It works to regulate markets by structuring supply, preventing overproduction, and setting quotas and fixed purchase prices. The marketing of other species, referred to as various wood species, has been liberalized since 1994, and their export is no longer controlled.

There are few local NGOs, environmental associations or civil associations, and so far the few existing ones are neither well-funded, nor well-organized and representative of local situations.

2.9.2. Status and trends in forest management

History of forest management and silviculture

Timber harvesting in Gabon began at the close of the nineteenth century and continued virtually unregulated up to the year 1913. The resumption of logging at a much faster pace following World War One made regulation of the sector imperative. In September 1924, a law was passed defining the various types of logging permits. This was paralleled by research and planting trials in 1928 on okoumé (*Aucoumea klaineana),* the major forest species harvested in Gabon. An incentive policy was established around the year 1930 to promote okoumé plantations. Various artificial regeneration techniques, such as the "strip method", were tested with a view to enriching the okoumé component of natural forests. This was quickly followed by full planting under progressively destroyed forest, which led in a few years to the replacement of the original forest ecosystem by a single-species understorey leading in 30 to 40 years to eminently loggable even-aged stands.

By 1932, the colonial administration had already established two forest areas for management purposes. The easily accessible coastal strip (5 million ha), or "Zone One", has remained in the hands of Gabonese nationals since 1962. The less accessible "Zone Two", which covers the rest of the country, was opened to the big, externally-funded logging companies in 1956. A 1945 law, amended in 1960, allowed logging rights to be allocated for periods of 5 to 20 years. The concessionaire was obligated to follow a set of specifications plus a management plan drawn up by the forest service – an early attempt at forest management. Logging permits were obligatory from that time on. Large-scale plantations date from 1945. Some 30 000 ha of okoumé were established, particularly in the early 1950s in the Mondah, N'kouloungа, Bokoué, Mvoum, Haut Como and Mbiné forests. Forest tree improvement work was also done on these stands from 1950 to 1957. The main actor at that time was the STFO (*Société technique de la forêt d'Okoumé*), now replaced by the DGEF. Other fast-growing species were also introduced (*Pinus* spp., *Eucalyptus* spp.) for plantations and for research. Various timber species were planted from 1985 to 1993, especially in the Bokoué stands, for clear felling. These included framiré (*Terminalia ivorensis*), limba (*Terminalia superba*) and bilinga (*Nauclea trillesii*).

The first major forest inventories began in the 1960s, prior to the building of the Transgabon railway. This zone, called the "*zone d'attraction du Chemin de Fer* (ZACF)", dates back to the early 1970s. It included over 3 million ha, most of which area was awarded in concession to European logging companies, with coastal Zone One remaining in the hands of Gabonese nationals. The okoumé trade had been a commercial monopoly since 1944 with the successive establishment of various monitoring bureaux: the OBAE (*Office des bois d'Afrique équatoriale*), the ONBG (*Office national des bois du Gabon*) and lastly the SNGB in 1975.

The 1970s saw the establishment of several management plans, especially in cooperation with FAO, such as the Gabon Forest Development Plan (GFDP). The Gabonese Government's commitment to sustainable forest management, in cooperation with specific private sector partners and NGOs, dates back to the 1980s. A number of pilot experiments and initiatives led to early forest management plans and the development of a methodology for land attribution.

The Ministry of Waters and Forests published a general policy statement on 1 June 1992 on forests and the environment. It focussed on environmental protection and improvement, sustainable resource management and conservation, and the economic development of natural resources. In 1996, the forest code reform process began in response to recommendations by the International Monetary Fund and the World Bank. The draft of the new forest code was presented to the National Assembly in September 1998. Sustainable management plans have proliferated in recent years in Gabon, especially in concessions awarded to private companies. Pilot management plans, aimed at sustainable management but also designed to serve as references or models, have been launched with international assistance.

Criteria and indicators for sustainable forest management

Initiatives were launched to develop Gabon-specific criteria and indicators for SFM. The ATO/CIFOR initiative consisted of a 1998 test on selected forest sites harvested by the logging company CEB-Groupe Thanry and Rougier-Gabon. These tests led to the development of a set of four principles, 16 criteria and 158 verifiers (controls).

The national working party (WP) on sustainable forest management and certification also carried out a participatory process to develop sets of certification criteria for sustainable forest management in Gabon, financed jointly by the European Union and the Dutch Government. Efforts to develop a specific set of principles, criteria and indicators (PCI) for Gabon were a major working party contribution to the process of forest certification in Gabon. The working party drew upon four sets of PCI from CIFOR, FSC, ITTO and ATO. In July 2000, a preliminary list of PCI was drawn up and tested for strong and weak points in four forest production units.

The DIARF/ITTO initiative, entitled “Dissemination, testing and specification of ITTO criteria and indicators for sustainable forest management in Gabon” was launched in 1999 for the purpose of “providing member countries with a better tool to evaluate changes and trends in forest conditions and management systems”. Two tests were carried out in 2000, followed by an evaluation workshop in February 2001, which ratified the set of C & I for this initiative (comprising 7 criteria and 47 indicators) at the forest management unit level.

Current practices for sustainable forest management

Management objectives
The new forest policy focuses on boosting and maximizing the forest sector contribution to Gabon’s economic and social development, whilst ensuring a lasting forest resource base through the consolidation and implementation of sustainable forest management programmes and national capacity-building. The new forest code covers sustainable forest management, harvesting, the industrialization of the sector, participatory forest management, and sustainable management of protected areas. Phase one (1998-2000) involves the overall preparation of forest management plans in accordance with national criteria for sustainable management and the establishment of sustainable management standards. Phase Two (2001-2010) moves on to the country-wide implementation of said sustainable management plans.

In terms of land use, the government's strategy is to set up a permanent forest area of 12 million ha, of which 8 million ha is intended for production forest and the remaining 4 million for protected areas such as protection forests, national parks, nature reserves, rational wildlife utilization areas, etc. An estimated 360 00 ha of state-owned forest lands are currently under sustainable management or else covered by forest management plans. By the year 2010, a projected 4 million ha will be managed, rising to 8.5 million ha by 2025. There are now 30 000 ha of state-managed plantations. The projected figure for 2010 is 50 000 ha, and for 2025, 100 000 ha. The target for managed private sector plantations is 100 000 ha by 2025.

Forest management plans
Implementation of the various clauses of the new forest law is a three-stage process. The first stage is a feasibility study for the sustainable management plan, including cost estimates for its preparation and implementation. If this study is approved by the forestry administration, a preliminary convention on management-harvesting-processing procedures is then signed by the concessionaire and the administration. Once the convention has been signed, the concessionaire has by law three years in which to draw up the sustainable management and industrialization plans for submission to the Government.

Under the new law, the management plan for which the permit holder is responsible comes under a Forest Management Unit (Unité forestière d'aménagement – UFA). One or more UFAs constitute a forest concession under sustainable management (CFAD), with a minimum management period of one rotation (which the forest law sets at a minimum of 20 years, but generally 30 years or more). These guarantees secure resource access to the concessionaire. A CFAD covers an area of 50 000 to 200 000 ha. Any management unit may include one or more associated forest permits (permis forestiers associés, PFA). These permits, of areas limited to less than 15 000 ha for a ten-year period, are to grant only to Gabonese nationals. PFA are to be managed in accordance with procedures currently under the technical scrutiny of the forestry administration. Although the forest law stipulates management in association with the CFAD holder, in practice there is the problem of the consolidation of forest permits and, most of all, the problem of reaching the necessary accord among all PFA holders to pool their technical and financial resources.

Twelve logging companies have begun work on sustainable management plans for a total area of some 6 million ha. At present, only one, the *Compagnie Equatoriale des Bois* (CEB), which has drawn up its own management plan, is in the process of signing the final convention on management-harvesting-processing procedures. Should the administration approve this management plan, it will be the very first company in the Congo Basin to work in full conformity with national forest harvesting standards.

Four additional companies have signed preliminary agreements and are in the process of drawing up their sustainable management plans. These are Rougier Océan Gabon (ROG), Leroy Gabon, *Société de la Haute Mondah* (SHM) and the *Société des bois de Lastourvill*e (SBL).

Four more companies have just completed their feasibility studies, but have not yet signed the preliminary agreement. These are Lutexfo-Soforga, Bordamur of the Asiatic group Rimbunan Hijau, *La Compagnie des Bois du Gabon* (CBG) and *La Compagnie Forestière des Abeilles* (CFA).

All these sustainable management plans are scheduled for completion by the year 2005, more or less, and concern some 6 million ha.

As for community forest management, the regulatory provisions now on the drawing-table stipulate that such forests shall conform to simple management plans under the responsibility of the forestry administration.

Forest law stipulates a five-year transition period prior to the implementation of the community forests. During this time family harvesting quotas (harvesting rights under earlier forest law exclusively for Gabonese nationals) can be allocated by province.

Silviculture
A total of 15 species are now harvested from natural forests, a figure projected to rise to 30 species by the year 2010 and 60 by 2025. The main productive species in Gabon are red wood (*Pterocarpus soyauxii*), ebony (*Diospyros* spp.) and okoumé (*Aucomea klaineaina*), the foremost species. A great many studies have been done, especially on natural regeneration of okoumé. Natural forest improvement (or natural regeneration) by means of seed cutting and single shelter were tested. Once forest cover has been opened for commercial harvesting, a complementary selective clearing of the dominant secondary species follows immediately to promote the long-term growth and natural regeneration of the dominant commercial species. The objective is forest tree composition improvement. The "okoumé method" is also based on existing natural regeneration, and takes its inspiration from the "*futaie règulière par parquets*" technique. This involves forest inventory and silvicultural techniques which include counting mature okoumé (technical harvesting diameter 70 cm) and thinning to bring final stem density of okoumé up to 80 stems/ha.

Okoumé is also the dominant plantation species, but other fast-growing species such as *Pinus* spp. and *Eucalyptus* spp. have also been introduced. Plantation methods include clear cutting, cleaning the undergrowth by eliminating all stems less than 10 cm in diameter, followed by under-planting, line-planting and then full planting. Minimum planting density is 625 stems/ha. From the standpoint of resource regeneration, there is currently a downward trend in the already minimal reforestation programmes (36 000 ha in 2000), and towards greater investment in the management of natural forests to promote the regeneration of high-value species.

Forest conservation measures
Protected area systems were launched in 1946 with the establishment of the Lopé-Okanda Reserve by the Administration of French Equatorial Africa, which included present-day Gabon. The Government subsequently extended the network, protected areas being one component of Gabon's conservation strategy. Plant and animal wildlife legislation is covered by chapter three of the forest code. Nearly 12 percent of the national territory, comprising 2.6 million ha, is now protected. Of this protected area, 897 500 ha are forest. The Government has recently indicated willingness to boost this to some 4 million ha in the near future. There is no National Park as yet, but there are wildlife reserves, nature reserves, and a presidential reserve. The National Biodiversity Observatory (NBO) established by the Council of Ministers on 27 July 2000 is another expression of implementing national environmental management strategy through the establishment of a natural resource network. The NBO is a prime component of the National Strategy and Action Plan for Biodiversity (NSAP/BD).

Forest protection measures
NO AVAILABLE DATA

Forest harvesting practices
Timber harvesting in Gabon is selective, focussing on a few high-value species. Minimum harvest diameters and a minimum rotation of at least 20 years must be respected, at least in theory. One chosen method for removals in the production series is to indicate the minimum which can be harvested over a maximum area in order to meet the objective of steady production. Recommended silvicultural measures are based on the natural regeneration of okoumé, focussing on the immediate vicinity of the selected seed-trees. Regeneration techniques also concern patches of okoumé. The selected harvesting practice in this case is to clear-cut the patches of okoumé, leaving one or two seed-trees/ha to favor the natural regeneration of the species. The improvement of natural okoumé stands consists of crown thinning of stems 20-40 cm in diameter, for the purpose of bringing the stand up to the final density of 80 dominant stems/ha.

Public participation in forest management
Villagers may freely exercise customary usage rights to the entire forest domain for subsistence purposes provided that these rights are exercised in such a way as to ensure the continuity of the resource. With the exception of the foregoing “no one is authorized to harvest trees or forest products without charge and without the prior authorization of the Waters and Forests administration”.

Special programmes and incentives to promote sustainable forest management

The current national development strategy of the Government of Gabon is based on diversification of the national economy. In implementing this strategy it is committed to restructuring and reorganizing natural renewable resource management. This primarily concerns the forest, fisheries, and, in a broader sense, the full range of environmental goods and services, including ecotourism, biodiversity, carbon sinks, and the like. A series of institutional and statutory reforms and planning exercises have been implemented for this purpose in recent years to promote sustainable economic development in Gabon. Of particular relevance are the ongoing development law, the National Environmental Action Plan (NEAP), the National Forests Action Plan (NFAP), and the National Strategy and Action Plan for Biological Diversity (NSAP/BD), adopted on 27 July, 2000, among others. The Government, through the Ministry of Forest Economy, Water, and Fishing in charge of the Environment is committed to the preparation of a forest sector investment programme known as the *Programme Sectoriel Forêt-Environnement* (PSFE), as a means of implementing the recommendations of these strategy exercises and pursuing institutional and statutory reform.

The strongest expression of the Gabonese Government's commitment to sustainable forest management is its adherence to the various international undertakings, such as the International Tropical Timber Agreement in 1983, ITTO's Target 2000 in 1990, and so forth. The joint motivations of the nation and of the international community have naturally led to a body of forest management research and development work, involving both the forestry administration and external donors. This includes studies to broaden the knowledge base crucial to forest management and pilot management plans. Among these are the benchmark ITTO project for the Bokoué forest area, completed in 1996, and the Sud Estuaire management effort carried out by the World Bank-funded Project Forestry and Environment, which replicates the measures utilized in the Bokoué project.

The ITTO/WWF Project (inventory and preparation of the management plan for the Minkébé Forest Area) consists of a pilot project in a nature reserve to define specific standards and modalities for forest and game management (1996-1998). WWF-Belgium and the Silviculture Unit of the Department of Agronomy of the University of Gembloux in Belgium also designed a pilot project entitled "Applied research and technical assistance for harvesting in the context of sustainable management for Central African forests". Its main thrust is to contribute to sustainable forest resource management through assistance to an established logging company working in Gabon.

Regional programmes and projects have also emerged, such as ECOFAC (Conservation and rational use of forest ecosystems in Central Africa), CARPE (Central African Regional Programme for the Environment), and others. The Central African Protected Areas Network (CAPAN), launched in Yaoundé and headquartered in Libreville, represents a new structure for monitoring the ECOFAC programme. The economic alternatives approach based on a combination of incentives and disincentives is increasingly used in the field, particularly with relation to salary payments and the financial spin-off of projects, especially tourism-related projects, such as the Lopé Reserve project (ECOFAC). New protected areas are also planned, as are protection and rehabilitation efforts, especially in the more degraded coastal forests.

Financing by the Global Environment Facility (GEF) in the context of Gabon's *Programme sectoriel forêts et environnement* (PSFE), will provide support for sustainable management for biological diversity and protected areas as a means of backstopping national and international efforts to set up a workable and effective network of protected areas in Gabon. The GEF will also help finance biodiversity-related activities in the institutional, legal, information, communications, research and training sectors.

Trends in forest management

In the last ten years or so, Gabon has embarked upon a reform of its forestry and environmental sectors. The new forest harvesting policy is designed to increase and maximize the forest sector's contribution to Gabon's economic and social development by setting up fairly extensive forest concessions entailing regulatory provisions for forest harvesting and sustainable forest management, including obligatory local processing. The resource management strategy is to maintain forests in the long term through the consolidation and implementation of SFM programmes and institutional capacity building.

The institutional changes currently in the pipeline also tend to delegate part of the responsibility to local actors for effective resource management. Two main trends emerge concerning the state role in SFM. Firstly, the total area of state-managed forests is shrinking as most of the old “permanent production forests” now come under the heading of listed state-owned productive forests which can be managed by the private sector. The official sector is nonetheless responsible for producing and funding simple community forestry management plans for production purposes. Secondly, the total forest management area is increasing given the fact that only rural area community forests not intended for production are not subject to management under the new law.

Concerning management as such, there is a trend to promote forest species for which markets have yet to be established, in tandem with efforts to optimize yields of commercial species through recovery and processing.

Key issues and concerns

Gabon has one of the lowest deforestation rates in all of Africa, except for forested areas in the vicinity of urban settlements. Forest destruction and conversion for other purposes primarily involves agriculture (mainly traditional farming), but in some cases also industrial farming. Other and more local causes of deforestation include infrastructure development, forest exploitation, oil exploration and operations, and mining. With selective forest harvesting, the main forest degradation problems concern the increasing scarcity of high-value species.

The application of forest law is currently encountering problems due to the absence of the implementation procedures required for full and coherent application of the law. With the exception of the logging companies, which usually enjoy sufficient technical and financial resources and are now undertaking the management of their forest concessions, there remains the problem of the presence of national operators in the sector, and, above all, the management of small forest concessions. The industrialization of the wood sector under the direct management of the forest concessions, though intended to promote added value and a lasting resource base, does however run the risk of over-capacity of the processing sector and its monopolization by a few economic operators.

Community forestry implementation represents a major challenge of the new forestry policy in terms of the social implications.

The limited field presence of the forestry administration obviates effective monitoring of the execution of ongoing and future preliminary conventions governing management-harvesting-processing activities. The technical services are not usually very effective due to the paucity of well-trained staff and material resources. Project Forestry and Environment Project (PFE), now in the closing stages, has partly filled some of these gaps in institutional capacity, thanks to its logistical and staff training contribution. This progress needs to be consolidated on a permanent basis.

The lack of resources and qualified staff also explains some of the problems faced by protected areas in Gabon. None are legally protected from selective harvesting for wood and none have a management plan, with the exception of the Gamba Protected Area Complex which does have a management master plan, as do the Lopé Okanda and Mindébé Reserves. The highly complex nature of Gabon's forest ecosystems, the lack of a solid knowledge base concerning these systems and the frequently disappointing results in the silvicultural sector, despite substantial efforts, all add to the difficulties which official forest management staff encounter in the preparation (and especially the implementation) of forest management plans consonant with international requirements. So little is still known about Gabonese forests in terms of the state of the forest, and actual potential and biological diversity. And this is also true of the various values attributed to forest resources by the principal actors involved. The flagrant lack of forest inventory is the major cause of this knowledge gap. Much remains to be done in terms of charting and making the most of Gabon's forest resources. It is worth mentioning that research, though embryonic, is much advanced by projects such as the FORAFRI project for the capitalization and transfer of existing results from research on tropical humid forests, or the Regional Environment Information Management Programme (REIMP).

In light of the new conservation and sustainable development challenges in the sub-region, forest training needs to be strengthened on several levels, including laying the ecological foundations for sustainable harvesting, and the necessary data on the cultural and socioeconomic contexts, resource utilization, co-management, and the planning, monitoring and evaluation of forest exploitation.

2.10. Rwanda

2.10.1. Legal and institutional framework for sustainable forest management

Legal framework

Law n°47/1988 of 5 December 1988 concerning the forest regime in Rwanda abrogated an earlier decree of 18 December 1930 (with a complementary series of ordinances) regulating the cutting and sale of wood in Rwanda Urundi. The law now in force specifies: forest domains – public domain, private and communal; forest conservation and forest harvesting; tree-planting, forest supervision and penal provisions, as well as transitory and final arrangements. It also lists the institutional instruments for planning and implementing forestry work, such as the various forest plans and services, which come under the Ministry in charge of forests, and whose duties and organizational structure are legally defined. The law also provides for a forestry commission in each prefecture to be responsible for administrative coordination with forest-related domains such as agriculture, livestock production and soil conservation. A national forestry fund to backstop forestry activities has also been set up to finance a range of forestry operations such as reforestation, forest nurseries, research and the like. A new, development-oriented forestry policy drawn up in late 1993 was to have been submitted to Parliament. Unfortunately the events of 1994 brought this process to a halt.

Forest institutions and forest managers

The Land Law identifies the State as the landowner and gives the people usufruct rights. The national forest law of 5 December 1988 specifies three categories of forest land, however. These are: state-owned or public domain forest; communal forest, comprising community-afforested land and public domain land granted by the government to the community, or land requiring reforestation classified under the name of the community; and, private forest comprising individually owned forest land.

A national forest service was established under Rwanda's new forest law. The service is responsible for planning and implementing forest development operations, conservation, management and exploitation within the state sector, control of all forest services and training forest service staff. Four state institutions are currently working in the sector: the Forest Service (FS) -- (*Direction des forêts*), the Rwanda Office of Tourism and National Parks (ORTPN), the Environmental Protection Service and the Rwanda Institute of Agricultural Sciences (ISAR).

The Forest Service comes under the Ministry of Agriculture and Livestock (MINAGRI). It is responsible for the design and implementation of forest management policy and programmes. The FS was modified in the wake of the 1994 war and genocide. It is currently made up of three Divisions, which are in turn subdivided into several sections. The three Divisions are Reforestation and Agroforestry, Forest Management and Planning, and Technology and Processing. The forestry administration is represented at the national level by the FS. In the field it is represented at the provincial and district levels by forest rangers. The ORTPN comes under the Ministry of Commerce, Industry and Tourism (MINICOM) and is responsible for the management of Rwanda's national parks and reserves. The Environmental Protection Service comes under the Ministry of Land Resettlement and Environment and plays a role in environmental monitoring. Forestry research is the responsibility of the Forestry Department of the Rwanda Institute of Agricultural Sciences (ISAR), and the private forest sector works mainly in the forest products production and marketing sectors.

2.10.2. Status and trends in forest management

History of forest management and silviculture

The earliest reforestation efforts, dating from 1920 to 1948, had the dual function of protecting mountaintop areas from erosion and supplying fuelwood. The objective was to afforest one ha of woodland for 100 persons. Although Rwandese forests had been declared official reserves by the colonial Belgian authorities in 1933, enforcement of the regulations was frequently lax and irregular. Some 20 000 ha of communal land had been afforested by 1967. The year 1967 also marked the debut of true forestry in the country with the Kibuye Pilot Forestry Project, which established 5 500 ha of wooded area. The Rwanda Institute of Agricultural Sciences, founded in 1962, also has a silvicultural research department.

During the 1970s, the objectives of Rwanda's forestry policy were the constitution and long-term conservation of forest resources. Increasing, improving and enhancing forest production and the utilization of forest products were additional targets. The major, observed, degradation of forest cover during the 1970s gave rise to the establishment by decree of the Rwanda Office of Tourism and National Parks on 26/04/74. Intensive replanting efforts were also carried out between 1975 and 1990. The year 1975 represented a turning-point in the practice of forestry in Rwanda, with that year marking the debut of a major reforestation campaign and a succession of large-scale development projects, each with a major forestry and agroforestry component. The "Umuganda" community forestry works launched in 1975, and National Arbor Day, which began in 1976 and is celebrated on the last Saturday in October, helped to mobilize the population. Planting activities were really stepped up during the years 1975-1989, with planted areas rising from 25 500 ha in 1975 to 247 500 ha in 1989. A steady but modest growth continued up to 1994, at which time all economic activities came to a standstill with the war and genocide of that year.

In parallel, with the 1984 establishment of the Forest Service by Ministerial Order on 23/02/1984, came an action plan for the conservation and management of natural forests on the Congo-Nile Crest, a 15-year programme. In 1985 the Government of Rwanda also formulated environmental policies and strategies designed to achieve sustainable harvesting of resources, as spelled out in the documents of the national environmental strategy (SNER) and National environmental action plan (NEAP) adopted by the Government in 1991.

In 1988, the law organizing the forest regime was promulgated in Rwanda. From 1989 to 1993, there were several major projects to establish public and private forest plantations with the distribution of forest seedlings from forest nurseries. The gallery forests and savannas of the eastern part of the country also came under some 1990 "forestry and agro-silvo-pastoral policy planning guidelines to safeguard ecological balance in the eastern savanna region in Rwanda". An overview forestry policy document prepared in 1993 was to have been submitted to Parliament, but unfortunately this process ground to a halt with the events of 1994. This policy was, however, updated after the war and became part of Rwanda's white paper on agricultural development policy and strategy, which is currently the benchmark document for the sector. Reforestation efforts were not pursued after 1994 as other sectors of the country were given priority for the reconstruction effort.

All forestry activities were suspended from 1993 to 1995, and some of the forest plantations were completely destroyed by displaced people fleeing the war. Forestry activities resumed on a very modest scale between 1995 and 1999, with a few efforts at reforestation and forest seedling production by some NGOs and some projects. During this same period, afforested areas were irreversibly destroyed for new settlements. Nursery seedlings were also distributed to peasant farmers, which helped to increase the area under private forest plantations. In the public domain, some of the public woodlands which had been destroyed have now been reconstituted and by the year 2000, plantations covered 261 000 ha. The situation is beginning to stabilize now that the National Forest Service has been beefed up and the forestry sector has gained new importance in the eyes of the authorities.

Criteria and indicators of sustainable forest management

NO AVAILABLE DATA

Current practices for sustainable forest management

Management objectives
Management programmes and plans were designed in accordance with the types of natural forests. The action plan for the conservation and management of the natural forests of the Congo-Nile Crest, a 15-year programme covering some 85 200 ha, was prepared in 1984. The 1987-1997 ten-year plan had called for the classification and management of 50 000 ha of gallery forests in eastern Rwanda, but neither management nor classification actually took place, as it turned out. Forestry and agro-silvi-pastoral policy planning guidelines to safeguard ecological balance in the savanna region of eastern Rwanda were also proposed. Management contracts and plans were also signed in the public domain and communal forests. Forest law made it compulsory for all communities to prepare and implement a communal forest management plan. But problems in the aftermath of the 1990 war and 1994 genocide greatly upset the pursuit of forest management activities and objectives. The main focus of forest policy today is to try to conserve and manage wooded areas, to reconstitute and rehabilitate forests destroyed and damaged by the war, to develop private and communal forestry, and to promote the emerging market for forest products.

Forest management plans
In theory, the public domain forests are directly managed by the Forest Service and the communal forests by communities under the supervision of this Service. In either case, however, it is possible to transfer responsibility for management to third parties through contracts or authorizations. The forestry administration retains control over operations in any case, and supervises the management plans and (obligatory) felling permits required for all forest units, even private ones, greater than two ha in size. Zonal management units (UGZ) have been put in place for the natural forests of Nyungwe, Gishwati and Mukura. But given the paucity of human and material resources now available, it is terribly hard to monitor the extent to which these measures are actually respected.

Silvicultural practices
The dominant species planted in Rwanda are, by far, *Eucalyptus* spp., followed by *Pinus* spp. Other species such as *Acacia* spp., *Casuarina* spp. and *Cupressus* spp. are less commonly found. Various silvicultural models for plantations have been tested, such as the trials on *Pinus patula* with final felling at 25 years and various interventions during the cycle, such as thinning at 5, 8 and 12 years. A production model has also been designed for *Acacia melanoxylon*, with the final felling at 40 years involving 200 stems/ha, and another for *Eucapyptus*, with a production model based on composite forest (coppice-with-standards) retaining 100 stems/ha at 20 years. Rwanda has a long tradition of agroforestry. The most commonly planted species are *Grevillea robusta, Leucaena* spp., *Calliandra calothyrsus* and *Sesbania* sp.

Forest conservation measures
After independence, Rwanda established a body of legislation designed to conserve the natural environment. The 18 June 1973 law, amended by decree on 18 December 1973, led to the establishment of the Rwanda Office of Tourism and National Parks (ORTPN) and set forth the rules and regulations governing national parks and reserves. The law also focussed on soil conservation, particularly in the case of roadwork and mining operations, giving the forestry administration the authority to monitor worksites and to ensure that clean-up operations actually took place.

There are two types of protected areas in Rwanda: the National Parks and the Reserves. Together, they cover some 360 000 ha, of which 226 600 is forested, or nearly 15 percent of the national territory. There are two officially designated national parks in Rwanda: Akagera and Les Volcans. Les Volcans National Park is contiguous with Virunga National Park in the Democratic Republic of Congo, and was formerly part of Albert National Park, established in 1925 under the Belgian colonial regime (Africa's first officially designated National Park). Just prior to the 1994 war, Akagera National Park had a vast hunting reserve where sport hunting was practiced. The Park is now down to one-third of its pre-war size, i.e. some 90 000 ha. The Mukura and Gishwati forest reserves are managed as multi-use areas. Exotics have been planted in buffer zones around each reserve, and a number of natural forest management models are under study, especially selective harvesting and enrichment planting. Additional planting of commercial species is planned in Gishwati forest. A similar general management plan has been drawn up for the Nyungwe forest reserve, which would be split into a management zone and a full conservation zone.

Forest protection measures
The first attacks of the pest *Cinera cupressi* on cypress plantations, the third-ranking species on all plantations in the Congo-Nile Crest, began in 1988. This pest has virtually decimated all cypress plantations in the Congo-Nile Crest, and throughout the country as well. Drought and termites are two further constraints to the reforestation of Rwanda's eastern savanna regions. Pests and fungal pathogens are responsible for tree desiccation in forest areas, representing a particular and permanent threat to mono-species plantations.

The war-induced social unrest prevalent in the country since the 1990s led to unauthorized clearing and illegal appropriation of wooded land for farming, and the consequent burning off of this land. To give one example, the amount of woodland burned in the year 1992 alone is estimated at about 13 000 ha. The law does specify preventive measures such as firebreaks to prevent the spread of forest fires.

Forest harvesting practices
The Code spells out the requirements with respect to felling, clearing and transport in the harvesting permits issued. Felling permits are not required for trees intended to be used for home consumption or for trees growing on private lots under two ha in size. This is justified by the existence of a tree-planting regime which specifies a minimum number of trees which must be maintained on the land. The clearing permit is issued by the Ministry in charge of forests, and comes with the obligation to reforest with an equivalent number of trees. Felling and clearing permits make it possible to levy the taxes which, together with sales of state-owned forest products, constitute the major source of revenue for the national forest fund.

Public participation in forest management
The "Umuganda", a community-based public works programme launched in 1975, and National Arbor Day, introduced in 1976 and celebrated every year on the last Saturday in October, provided vehicles for mobilizing public participation in Rwanda. These practices have fallen into disuse, however, and to date no effective public participation efforts have been made in the context of environmental and resource management. Public participation in agroforestry and tree-planting projects has been impressive, however.

Special programmes and incentives to promote sustainable forest management

Rwanda has on the books a ten-year National Forests Action Plan (1987-1997), which was updated in the TFAP context, and studies were also done in a number of forest-linked sectors. These documents served as the basis for a preliminary series of ten-year national forest plans (1993-2020), but the process came to a halt and was not resumed after the events of 1994.

Concerning plantations and reforestation, the forest law in force set in motion a tree-planting regime to complement the reforestation effort. This is a legal instrument designed to develop forest plantations on agricultural land for the dual purpose of soil protection and wood production.

Concerning forest conservation, MINAGRI, in compliance with a Ministerial Order of 28 March 1988, adopted an action plan for the restoration, conservation and management of the forests of the Zaire-Nile Massif. Generally speaking, this action plan intended to designate specific areas of the Nyungwe and Gishwati forests as nature reserves, and to prepare and implement a forest management plan for areas so designated. To facilitate the work of the services responsible for project execution, the plan also called for a national level forestry commission for the natural forests of the Zaire-Nile Crest. It would have three sections: management, conservation and research. Rwanda also received international assistance for a number of years for the implementation of projects and programmes such as the 1974 “Tourism and National Parks” project, targeted primarily at developing tourism in protected areas. In 1990, the Flora and Fauna Protection Society helped to launch the International Gorilla Conservation Programme. Sadly, all of these efforts have suffered severe setbacks due to the civil wars of the past decade.

Trends in forest management

National production slumped dramatically in the aftermath of war in1990 and the genocide that took place in 1994, and down with it went the buying power of the country’s inhabitants. The Government, in an attempt to redress the gap in domestic production and jump-start the economy was forced to resort to imports and at the same time to accept a Structural Adjustment Programme (SAP) featuring privatization, market liberalization and decentralization. In the forestry sector, these new directions took the form of reinstating the central government in its role of planner and regulator of exchanges concerning the forestry sector even as it gradually withdrew from the production side. Grassroots and communal administrative structures also came to play a growing role in forest management. The Government of Rwanda thus embarked upon a decentralization policy which had the effect of beefing up district and provincial administrative capacity. Some decisions formerly taken at the national level were turned over to local government structures. This process featured a new administrative delineation of the territory, reorganization of the central structure and the transfer of more power to decentralized structures. The population of the country, however, continued to carry on in a post-war context in which the most immediate need was survival. And so, given the scarcity of land and the mounting needs of the population, the only forest management practices likely to boost forest products on a national scale are probably tree-planting campaigns and agroforestry.

Key issues and concerns

The outbreak of war in 1990 and especially the genocide in 1994 weighed very heavily on the forestry sector. Forest service staff lost their jobs and war-displaced people cut down or damaged a great many forest plantations. Both the plantations and the natural forests were tapped to help rebuild and resettle both former and new waves of refugees. In such a context, forestry activities obviously took a back seat to the survival needs of the population. And farmers, taking advantage of the momentary lull in the government presence, also cleared areas in the public domain forests. The upshot of all this is that Rwanda now has one of the highest rates of deforestation in Central Africa, and perhaps all of Africa. A rapidly growing population also exerts immense pressure on the natural resource base, especially on soils in the countryside, where the extreme fragmentation of family farms has led to extremely tiny family plots on eroded and infertile soils. This misuse of the soils and the dispersed nature of population settlement in Rwanda are twin phenomena oft-decried by the environmentalists.

The new Rwandese policy on settlements is, however, trying to solve the problem by encouraging the formation of more densely populated villages called “imidugudu”. The destruction of plant cover is also a result of the search for fuelwood and of overgrazing, this latter further aggravated by the presence of large herds of cattle newly moved into the region. Forestry statistics are also in a very poor state, given the fact that no national inventory of woody resources has ever been carried out in Rwanda. The currently available data date back to a very few surveys made by MINAGRI in the 1980s.

Forestry service operations are presently severely handicapped by a numerical and qualitative dearth of human and material resources. Forestry service administrative capacity is now extremely weak, and this of course has a very negative impact on forest resources, resulting in further degradation. This is paralleled by a reduction in the effort to establish new forest plantations, shrinking forested area, poor management of Rwanda’s forests, and severe problems with enforcing forest laws and regulations. The articles of law covering penal provisions and policing the forest are also deemed inadequate to the present context. The forest law has been on the books since 1988, but not all of the legal steps have been taken to date to make this body of legislation fully operational. There has been no publication or updating of implementation procedures.

Concerning forest conservation, the legislation is appropriate but the ways and means of effectively enforcing these regulations are nonexistent. Implementation of the law is severely hampered by Rwanda’s short-staffed and poorly trained forest service, aggravated by an unstable national political context. In addition to these constraints, areas habitually protected by conservation legislation have been re-designated as refugee settlement areas.

Forest projects, compared to the situation prior to 1994, are few and far between. Most of the countries formerly involved in bilateral cooperation and which offered institutional support for the forest services in the pre-war period have not yet returned. Public investment in forestry projects has also been slashed. The impact of this lack of investment has thrown forest management into a sort of limbo, with a dysfunctional forestry administration and advancing deforestation.

To conclude, bearing in mind the tragic events of recent years, the state of Rwanda's forests and their management is clearly in decline. The extent of the decline is extremely hard to chart with any degree of exactitude, especially given the fact that political stability has not yet been restored even today. Despite this, war-induced population movements have just been stabilized, and the emergency phase is now giving way to a new development phase.

2.11. São Tomé and Príncipe

2.11.1. Legal and institutional framework for sustainable forest management

Legal framework

Portuguese legislation on forests and wildlife dating from the colonial era was replaced by Decree Law n°5/79 10 March 1979. The Directorate of Agriculture and Forestry (*Direcção de agricultura e florestas*) was established as part of the Ministry of Agriculture and Fisheries (*Ministerio de agricultura e pescas*) under this same law.

A new forest law, proposed in 1985, differentiated between protection and production forests. Protection forests were subdivided into wholly and partially protected forests. Within wholly protected forests no tree may be harvested. Under this heading are listed all riverine forests, high-altitude forests and forests of exceptional historic or scientific interest. Partially protected forests are those where special precautions must be taken during extraction to avoid environmental damage. This forestry policy also mentions the conservation and rational use of forest resources. The law has been prepared, but not yet adopted.

There is no existing legislation on forest resource conservation, forest harvesting, the establishment of protected areas, or the protection and management of wild plant and animal life.

Forest institutions and forest managers

The land belongs to the state and comes under the responsibility of the Ministry of Agriculture and Fisheries (*Ministério de agricultura e pescas*). This Ministry holds full responsibility for the implementation of forestry and wildlife policy. It is also responsible for directing and monitoring the production sector, for development project execution, and for the legal provisions and fiscal questions concerning the forestry sector, as stipulated in Decree Law n°5/79. The Directorate of Agriculture and Forestry, established by the same law, is made up of four departments, including the department responsible for permanent crops and forestry.

The Ministry of Agriculture and fisheries set up a Forestry Commission to coordinate the sector (*Commissao de coordenação florestal*). It is responsible for the supervision of all forest lands and the promotion of a national forest service. The Commission also formulates all legislation concerning forest management.

A local NGO, the Friends of Nature Association (*Associação dos amigos da natureza*), founded in 1988, is still awaiting official status from the Government. Among its objectives are the promotion of sustainable resource management and development, and habitat conservation.

Forest research comes under the mandate of the Directorate for Technological Development within the Ministry responsible for forestry, but little or no research has been done so far.

2.11.2. Status and trends in forest management

History of forest management and silviculture

Early in the second half of the nineteenth century, the entire island of São Tomé, where sugar cane production was just beginning to be developed, was put under cocoa plantations, becoming the prime world producer of cocoa by the end of that century. The island landscape was thus largely shaped by the cocoa companies, since at the time of the 1910 cocoa boom, these companies were working nearly 90 percent of the island's arable land area. The decline of cocoa production, already underway before independence was declared in 1975, caused a great many of the cocoa plantations to be abandoned. Many have since reverted to forest land.

In the mid-1980s, the Government, which had nationalized the big Portuguese agricultural estates after independence, began to cede land to private individuals on a concessionary basis, though no legal provisions for this were made. What happened, in effect, was that harvesting rights to land were awarded, but not title to that land. Which meant that the land remained in the hands of the State.

Forest harvesting has long been practiced in the secondary forests and the shade-tree forests of the farm plantations, and yet no reforestation programme has ever been undertaken. The remnant natural forests which survived did so because they were growing on land unsuitable for either cultivation or human habitation, such as steeply sloping land.

Criteria and indicators for sustainable forest management

NO AVAILABLE DATA

Current practices for sustainable forest management

Management objectives

There are no formal forest management plans for production, conservation, or any other purpose.

Forest management plans

A special permit issued by the Directorate responsible for forestry is required to fell trees anywhere other than on farmland. Such a permit is normally granted only when accompanied by a serious justification of the need to fell said tree(s). It is only supposed to be issued to state agricultural enterprises to meet the need for construction wood and fuelwood. There are no true forest management plans as such, however. And concerning forest conservation, no such areas have been designated in either island.

Silviculture
There is no national reforestation plan. Tree-planting basically takes place in the context of agroforestry models appropriate for coffee- and cocoa-growing. The species planted, both local and exotic species, come from the conservation of a portion of the trees growing in the original forests and the simultaneous introduction of exotics appropriate for this kind of agroforestry. There is, however, just one four-hectare *Cedrela odorata* plantation at Rio Lima which was established from 1978 to1980 to study *Cedrela* behavior. Other species planted include *Podocarpus mannii, Artocarpus* spp. and *Albizia falcata*. There are no reports of regeneration or improvement treatments in the natural forest stands.

Forest conservation measures
There are no formal protected areas in either island. However, ecological zones (*zonas ecologicas*) have been proposed for both islands to be located on high-altitude lands and steep slopes. The boundaries of these two areas have yet to be determined, however, and there are no legal protections other than the ban on tree-cutting. The ecological zone on São Tomé covers approximately 245 km^2 and on Príncipe some 45 km^2. There is no actual legislation on conservation as yet, but forest protection and wildlife conservation are part of the mandate of the Forestry Commission (*Comissão de coordenação florestal*) recently established under the Ministry responsible for forestry (*Ministério de agricultura e pescas).*

Forest protection measures
NO AVAILABLE DATA

Forest harvesting practices
The natural forest contains very few trees which would qualify as exploitable in terms of species and diameter. Those most in demand are Cedrella (*Cedrela odorata*), l'amoreira (*Chlorophora excelsa*) and jaqueira (*Artocarpus integer*). Forest harvesting is practiced in secondary forests and in the shade-tree forests planted in agricultural plantations. Logging is not permitted in the natural forests. There is no planning for forest harvesting, the extent of harvesting depending solely on the level of pressure exerted by users. Forest harvesting in São Tomé and Príncipe is selective. The minimum harvesting diameter is 60 cm, except for *Chlorophora excelsa* which must be at least 80 cm in diameter. Volumes felled are not monitored and there is no programme of stand reconstitution. Production takes place upon request by interested parties which must also specify the species and volumes to be extracted. Logging is done with power saws, caterpillar tractors, a loading winch, and small logging trucks. Tree-cutting anywhere but on farmland requires a special permit issued by the Directorate responsible for forestry. The Ministry also requires the volumes logged to be registered and communicated.

Public participation in forest management
NO AVAILABLE DATA

Special programmes and incentives to promote sustainable forest management

Since 1992, São Tomé and Príncipe have received assistance from the EU's European Development Fund (EDF) in support of the Forestry Commission's efforts to establish service wood and fuelwood plantations to prevent harvesting in primary forests and to promote efforts to educate the public about forest conservation. The IUCN published a detailed report on the problems of forest conservation in these islands as part of the preparation for ECOFAC's regional programme on the conservation and rational use of forest ecosystems in Central Africa. The ECOFAC Programme is responsible for setting up and managing the São Tomé ecological reserve which is to cover roughly one third of the island. The Programme is working in and around the São Tomé ecological zone to encourage reforestation and promote agroforestry and soil conservation techniques. The island's potential for ecotourism is also being developed. Since its creation in 1995, the "Future of People of the Tropical Forest" project has provided support for a number of Central African projects concerning sustainable management, conservation, development, planning, or in the cultural domain. In São Tomé, FPTF has worked in cooperation with ECOFAC.

Similar funding was provided in 1990 by the GTZ (*Gesellschaft für technische zusammenarbeit*), Birdlife International and the International Center for Conservation Education. Backed by USAID and EU funds, these organizations have participated in efforts to promote wildlife conservation and supplied educational materials to a São Tomé NGO founded in 1988 (*Associação dos amigos de natureza*) for the purpose of wildlife conservation.

REIMP, the Regional Environment Information Management Programme, is also active in São Tomé and Príncipe. The main goal of REIMP is to improve and strengthen planning and management of natural resources in the Congo Basin countries (Cameroon, CAR, the Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, and São Tomé and Príncipe. Its objectives include ensuring information circulation and enhancing the results of existing projects with an information component.

Trends in forest management

The broad outlines of the country's forestry policy were defined in 1985. The plan was for the forestry sector to play an ever greater role in the future socioeconomic development of the country. Forestry development was also to include specific forest management programmes and the nationalization of forest product extraction processes. Planned forest resource conservation is to take the form of ecological conservation zones.

Key issues and concerns

Forest harvesting for service wood in São Tomé and Príncipe has mostly involved creaming off the forests. Nor has there been any effort at reconstitution. Widespread forest impoverishment has been the result. In addition to this, what forest inventory data does exist is old and obsolete. The last nationwide forest inventory took place back in 1989.

The Ministry responsible for the forests not only has to cope with a paucity of forestry policy and legislation, it also lacks the human and material resources to effectively inspect and monitor forest harvesting and conservation practices. The Directorate in charge of forestry is equally deficit in the material and human resources it needs to effectively address its tasks. There are no management plans for the various types of plant formations.

As for conservation, some of the land initially included in the ecological zone has been distributed to small or medium farmers, so that the boundaries of the zone have already been rolled back. The areas bordering the ecological zone, much of which had earlier been abandoned and were to have served as a buffer zone, have also been distributed and are now in the process of being resettled. Major felling activities have also been observed.

3. CONCLUSION: STATUS OF FOREST MANAGEMENT IN CENTRAL AFRICA IN 2000

The definition used[5] in Africa to designate the area of managed forests is "the area of forests which is managed for various purposes (conservation, production, other) in accordance with a formal, nationally approved management plan for a sufficiently long period (five years or more)". Using this definition as a yardstick, no Central African country had by the year 2000 supplied complete data on the amount of forest land covered by a formal, nationally approved management plan (see following table). The only data meeting these criteria are those from the Central African Republic, and these are still only partial[6]. Likewise, the earlier tropical forest resource assessments of 1980 and 1990 provided no numerical data on the area of forest under management. Indeed, the tropical forest resource assessments done jointly by FAO/UNEP[7] in 1980 covered 37 countries in tropical Africa, and included every country in the sub-region except São Tomé and Principe, but this study also did not supply numerical data on the area covered by forest management plans. The 1990 global forest resource assessment listed figures for industrialized countries only.

However, looking at the individual national situations, each of the Central African countries has adopted strategies and plans of action in line with their specific situations. Management regulations have been proposed for each type of forest. In Gabon, for instance, a resource inventory and management plan proposal are obligatory pre-conditions to commercial exploitation of any sort. In Congo and in Cameroon, the public domain forest has been subdivided into forest management units, each with its own plan for resource development and utilization. Simple management plans have also been drawn up for the community or village forests. CAR's forest code, for example, calls for the submission of a management plan with specifications prior to the issuing of any harvesting permit, which makes the concessionaire responsible for forest management. In Rwanda, managed area units have also been established in selected forest areas. Significant efforts have been made to provide the technical guides necessary for field implementation of sustainable management pratices in the sub-region. A recent ITTO study [8] , for example, reported that Cameroon is one of the six tropical ITTO producer countries having met the necessary pre-conditions for sustainable forest management.

[5] FAO (2001). *Status and Trends in Forest Management Worldwide. 1980-2000*. By Mette Løyche Wilkie, November 2001. Forest Management Working Papers, Working Paper 6. Forest Resources Development Service, Forest Resources Division. FAO, Rome (*unpublished*).

[6] These data refer to the Ngotto and Sangha Mbaéré massifs.
RCA/Union européenne/Group AGRECO-Cirad-forêt 1996. Forêt de Ngotto- Plan d'aménagement forestier du PEA 169.
RCA/Caisse française du développement/Cirad-forêt 1997. Plan d'aménagement forestier du PEA 163 - Sangha Mbaéré.

[7] FAO/UNEP 1982. *Tropical forest resources.* FAO Forestry Paper 30, 106 pp., Rome.
FAO 1988. *An interim report on the state of forest resources in the developing countries*. Miscellaneous paper FO:MISC/88/7. Forest Resources Division, FAO.

[8] Poore, D. & Thang, H.C. 2000. Review of progress toward the year 2000 objective. Report presented at the 28th Session of the International Tropical Timber Council ITTC(XXVIII)/9/Rev. 2, 24-30 May 2000, Lima, Peru. Yokohama, Japan, ITTO.

Efforts have also been made to develop criteria and indicators for assessing sustainable forest management. Criteria and indicator tests have been conducted in Cameroon, CAR and Gabon since the mid-1990s, especially by CIFOR, ATO and ITTO. As for production forests, national standards for the preparation of management plans have been developed, as quite recently in CAR, but although there has been considerable focus lately on the issue of forest certification, the process is not yet up and running. There were no certified forests in Central Africa in 2000 (see following table).

Implementation has in any case been delayed in a number of Central African countries due to political upheavals, economic problems and/or civil strife, sometimes leading to great violence, all of which clearly run counter to achieving balanced development founded on the conservation and sustainable exploitation of natural resources. Moreover, generally speaking, the technical, financial, political and institutional situation in most of these countries is not such as to provide the appropriate underpinning for developing sustainable management

National forest management situations in Central Africa 1980-2000

Countries	Forest area 2000[9]	SFM criteria and indicators**	Area under forest management plans						Certified forest area 2000***	
			2000		1990		1980			
	000 ha		000 ha	%	000 ha	%	000 ha	%	000 ha	Plan
Angola	69 756	DZAf/ATO	-	-	-	-	-	-	-	-
Burundi	94	-	-	-	-	-	-	-	-	-
Cameroon	23 858	ATO/ITTA	-	-	-	-	-	-	-	-
Congo	22 060	ATO/ITTA	-	-	-	-	-	-	-	-
Gabon	21 826	ATO/ITTA	-	-	-	-	-	-	-	-
Equatorial Guinea	1 752	ATO	-	-	-	-	-	-	-	-
Central African Republic	22 907	ATO/ITTA	269*	n.ap.	-	-	-	-	-	-
Democratic Republic of Congo	135 207	ATO/ITTA	-	-	-	-	-	-	-	-
Rwanda	307	-	-	-	-	-	-	-	-	-
São Tomé and Principe	27	ATO	-	-	-	-	-	-	-	-
Chad	12 692	DZAf	-	-	-	-	-	-	-	-

* Partial results only. National data unavailable

** Members of the criteria and indicators process in Central Africa:

DZAf The Dry-Zone Africa Process on Criteria and Indicators for Sustainable Forest Management

ITTO International Tropical Timber Organization

ATO African Timber Organization

*** Although no forest in the sub-region was certified in 2000, certification schemes conducted by the FSC (Forest Stewardship Council) are currently underway.

[9] FAO, 2001. Global Forest Resources Assessment 2000. Main report. FAO Forestry Paper 140. Rome. http://www.fao.org/forestry/fo/fra/main/index.jsp

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